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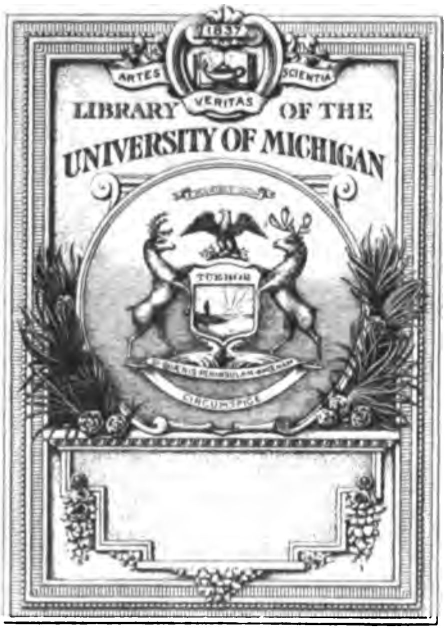
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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1877.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.

SECOND EDITION.

BUREAU OF NAVIGATION,
WASHINGTON.
1876.

PREFACE.

The preparation of the *American Ephemeris and Nautical Almanac* was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation and the values of the constants adopted will be found in the preface and appendix of the first volume, that for the year 1855.

The changes introduced in the volumes for 1865 and 1869 are described in the prefaces of the volumes for those and subsequent years.

HANSEN and OLUFSEN's tables of the sun were first used in the preparation of the volume for 1858; NEWCOMB's tables of Neptune in that for 1870; and HILL's tables of Venus and NEWCOMB's tables of Uranus in that for 1876.

The appendix of this volume contains corrections to the ephemerides of Uranus for the years 1873 to 1876 inclusive, prepared from NEWCOMB's tables, a table of logarithms of sines and cosines with the argument in time, and tables for finding the latitude of a place by altitudes of the pole-star.

J. H. C. COFFIN,
Prof. Math. U. S. Navy, Superintendent.

WASHINGTON, *May*, 1874.

370606

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CORRECTIONS.

EPHEMERIS FOR 1876.

Page 76,	May 16,	λ′,	*for*	24′	*read*	54′
211,		☾ Perigee omitted,				$31^d\,1^h.4$
214,	Dec. 8,	Sun, Noon,	*for*	75′	"	57′
259,	α Ceti,	An. Variation of Dec.,	"	16″.35	"	14″.35
260,	υ Leonis,	" " "	"	19″.14	"	19″.84
261,	ζ Ursæ Minoris,	" " of R. A.,	"	+	"	—
262,	ι Cephei,	Declination,	"	56°	"	65°
	12 Year Cat. 1879,	An. Variation of R. A.,	"	+	"	—
274,	Dec. 31, λ Ursæ Minoris,	Declination,	"	9″.7	"	8″.7
	" 32, " "	"	"	9″.4	"	8″.4
300,	α^2 Libræ, signs of diffs. of Declination should be changed.					
303,	β^1 Scorpii, " " " from Oct. 26 should be changed.					
304,	α Scorpii,	Declination,	*for*	26° 29′	*read*	26° 9′
316,	ν Cygni,		"	υ Cygni	"	ν Cygni
334,	No. 58,		"	λ Cancri	"	B. A. C. 2788
336,	No. 148	R. Ascension,	"	$44^s.01$	"	$44^s.27$
472,	App't discs of Venus and Mars, subtract 1^d from the dates after February.					
487,	line 2,		*for*	174	"	162
	" 3,		"	25	"	19

CORRECTIONS.

STAR TABLES OF THE AMERICAN EPHEMERIS.

First Edition.

Page V,	line	9 from bottom,	*for*	G'	*read*	G
V,	“	8 “ “ between $i \cos \delta$ and $\tau \mu'$ insert $+$				
XIX,	“	8 “ sin α and $(12 \mu$ “ $+$				
“	after line 10 insert, $\frac{d^2\delta}{dt^2} = -(m + 2\mu) n \sin \alpha + \frac{dn}{dt} \cos \alpha - \frac{1}{2} \mu^2 \sin 2\delta - n^2 \sin^2 \alpha \tan \delta$					
XXV,	line	8 from bottom,	*for*	$\delta . \Delta_\odot \alpha$	*read*	$\delta . \Delta_\odot \delta$
XXVII,	“	31	“	$-0^s.00015$	“	$+0^s.00033$
“	“	31	“	320°	“	279°
XXIX,	The numbers in columns 5, 7, and 8, of the second table, and “Var. of $\Delta_\odot \alpha$ in 10^y,” on page 92, require the correction, $+0^s.00048 + 0^s.00087 \sin (2\odot + 258°)$					
“	Heading of column 7,		*for*	$(2_\odot + H_\odot)$	*read*	$(2_\odot + H_{2\odot})$
XXXIII,	Last line,		“	G	“	$G_\odot$
15,	$A_\odot$,	Arg. 327	“	.62386	“	.02386
37,	Log D,	“ 9.6	“	.27851	“	.28851
38,	Log C,	“ 77.8	“	.27350	“	.27250
38,	“	“ 79.8	“	.27205	“	.27305
38,	“	“ 79.9	“	.27206	“	.27306
39,	Log D,	“ 109.5	“	.94849	“	.98449
41,	“	“ 144.4	“	.25614	“	.25624
43,	“	“ 183.2	“	.30529	“	.30519
43,	“	“ 183.3	“	.30518	“	.30508
43,	“	“ 183.4	“	.30501	“	.30496
43,	“	“ 184.9	“	.30707	“	.30307
51,	H,	“ 197	“	$40'.1$	“	$30'.1$
72,	17th line from bottom,		“	δ Ophiuchi	“	α Ophiuchi
75,	13th “ “ “		“	μ Aquarii	“	η Aquarii
84,	α Andromedæ,	R. A. 1877,	“	$6\text{–}^s.911$	“	$61^s.911$
85,	η Piscium,	Dec. 1875,	“	$13''.80$	“	$3''.80$
86,	ι Ursæ Majoris,	R. A. 1877,	“	$40^s.706$	“	$46^s.706$
87,	η Bootis,	Dec. 1876,	“	$11'$	“	$1'$
87,	β Corvi,	Dec. 1877,	“	$4'$	“	$42'$
88,	α Lyræ,	R. A. 1873,	“	$3\ ^s.307$	“	$38^s.307$
89,	“	Dec. 1874,	“	$40' - .51$	“	$40'\,3''.51$
102,	Mean day,		“	Dec. 24.89	“	Dec. 34.29
110,	Dec. 36,	$\Delta_\odot \alpha$, 1870,	“	—	“	+
110,	$\Delta_\Omega \delta$,	1875, 0^d,	“	$-5''.43$	“	$+5''.43$
111,	Feb. 19,	$\Delta_\odot \delta$,	“	$5''.94$	“	$5''.99$
113,	Dec. 36,	Var. of $\Delta_\odot \delta$ in 10^y,	“	6	“	-6
115,	“ 36,	Diff. of $\Delta_\odot \delta$ for 10^d,	“	-229	“	$+229$
118,	Mean day,		“	Sept. 26.71	“	Sept. 25.71
125,	Sept. 27,	$\Delta_\odot \delta$,	“	$16''.03$	“	$19''.03$
128,	March 11,	Var. of $\Delta_\odot \delta$,	“	1	“	-1
139,	Last line in	$\Delta_\odot \alpha$,			insert	+
158,	1872, 400^d,	$\Delta_\Omega \alpha$,	*for*	2.548	*read*	-2.548
161,	Dec. 36,	$\Delta_\odot \alpha$,	“	3.362	“	$+3.362$
164,	April 30,	$\Delta_\odot \alpha$,	“	3.319	“	2.319
169,	June 29,	Var. of $\Delta_\odot \delta$, in 10^y,	“	$+1$	“	-1
175,	Nov. 16,	Diff. of Dec. for 10d,	“	77	“	87
186,	Nov. 6,	$\Delta_\odot \alpha$,	“	1.9–4	“	1.934
208,	May 30,	$\Delta_\odot \alpha$,	“	1.227	“	2.227
229,	July 19,	Mean Day,	“	July 15.57	“	July 18.57
242,	April 30,	Var. of $\Delta_\odot \alpha$ in 10^d,	“	5	“	8
242,	Nov. 16,	$\Delta_\odot \alpha$,	“	4.420	“	3.420
254,	Table XXIX, α Ursæ Minoris,		“	$-0^s.0512$	“	$+0^s.0512$
255,	“ “	θ Aquarii,*	“	$-0''.43$	“	$+0''.43$

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1877, WHICH COMPRISES THE LATTER PART OF THE 101ST AND THE BEGINNING OF THE 102D YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6590 of the Julian Period;
" 7385–86 of the Byzantine era;
" 5637–38 of the Jewish era;
" 2630 since the foundation of Rome, according to Varro;
" 2624 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period, corresponding according to the chronologists to the 747th, and according to the astronomers to the 746th year before the birth of Christ.
" 2653 of the Olympiads, or the first year of the 664th Olympiad, commencing in July, 1877, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2189 of the Grecian era, or the era of the Seleucidæ;
" 1593 of the era of Diocletian.

The year 1294 of the Mohammedan era, or the era of the Hegira, begins on the 16th of January, 1877.

The first day of January of the year 1877 is the 2,406,621st day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	10
Epact	15	Roman Indiction	5
Lunar Cycle or Golden Number	16	Julian Period	6590

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, &c.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕ or ♁	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring signs.	1.	♈	Aries.	Autumn signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpio.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer signs.	4.	♋	Cancer.	Winter signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing 90° in " " "
☍ Opposition, or differing 180° in " " "

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

ASTRONOMICAL EPHEMERIS

FOR THE USE OF

NAVIGATORS.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	THE SUN'S Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be added to Apparent Time.*	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	18 48 58.58	11.035	S. 22 58 47.4	+12.91	16 18.46	71.10	4 0.30	1.175
Tues.	2	18 53 23.22	11.019	22 53 23.8	14.04	16 18.45	71.04	4 28.30	1.160
Wed.	3	18 57 47.51	11.003	22 47 33.0	15.18	16 18.44	70.98	4 55.95	1.144
Thur.	4	19 2 11.41	10.987	22 41 15.1	16.31	16 18.42	70.91	5 23.21	1.128
Frid.	5	19 6 34.90	10.969	22 34 30.2	17.43	16 18.39	70.85	5 50.06	1.110
Sat.	6	19 10 57.95	10.951	22 27 18.4	18.54	16 18.36	70.79	6 16.49	1.092
Sun.	7	19 15 20.54	10.931	22 19 40.1	19.64	16 18.32	70.72	6 42.45	1.072
Mon.	8	19 19 42.65	10.910	22 11 35.3	20.74	16 18.28	70.65	7 7.92	1.051
Tuos.	9	19 24 4.22	10.887	22 3 4.3	21.83	16 18.23	70.58	7 32.87	1.028
Wed.	10	19 28 25.24	10.864	21 54 7.3	22.90	16 18.18	70.50	7 57.26	1.005
Thur.	11	19 32 45.70	10.840	21 44 44.8	23.96	16 18.13	70.42	8 21.09	0.981
Frid.	12	19 37 5.56	10.815	21 34 56.9	25.01	16 18.07	70.34	8 44.34	0.956
Sat.	13	19 41 24.81	10.788	21 24 43.8	26.05	16 18.01	70.26	9 6.96	0 929
Sun.	14	19 45 43.40	10.761	21 14 5.8	27.08	16 17.94	70.17	9 28.94	0.902
Mon.	15	19 50 1.32	10.732	21 3 3.5	28.10	16 17.87	70.08	9 50.25	0.873
Tues.	16	19 54 18.55	10.702	20 51 37.0	29.10	16 17.80	69.98	10 10.86	0.844
Wed.	17	19 58 35.07	10.672	20 39 46.6	30.08	16 17.72	69 88	10 30.76	0.814
Thur.	18	20 2 50.85	10.642	20 27 32.9	31.05	16 17.64	69.78	10 49.93	0.784
Frid.	19	20 7 5.88	10.610	20 14 56.1	32.00	16 17.55	69.68	11 8.36	0.752
Sat.	20	20 11 20.15	10.578	20 1 56.4	32.94	16 17.46	69.57	11 26.02	0.720
Sun.	21	20 15 33.62	10.545	19 48 34.3	33.87	16 17.36	69.46	11 42.89	0.687
Mon.	22	20 19 46.31	10.512	19 34 50.4	34.78	16 17.26	69.35	11 58.96	0.654
Tues.	23	20 23 58.17	10.478	19 20 44.7	35.68	16 17.16	69.24	12 14.24	0.620
Wed.	24	30 28 9.23	10.444	19 6 17.7	36.56	16 17.05	69.13	12 28.71	0.586
Thur.	25	20 32 19.48	10.409	18 51 29.6	37.42	16 16.93	69.02	12 42.36	0.552
Frid.	26	20 36 28.91	10.375	18 36 21.2	38.26	16 16.81	68.90	12 55.19	0.518
Sat.	27	20 40 37.52	10.341	18 20 52.8	39.09	16 16.69	68.79	13 7.21	0 484
Sun.	28	20 44 45.31	10.306	18 5 4.6	39.91	16 16.56	68.67	13 18.41	0.449
Mon.	29	20 48 52.26	10.272	17 48 57.0	40.71	16 16.42	68.56	13 28.77	0.415
Tues.	30	20 52 58.38	10.238	17 32 30.2	41.50	16 16.28	66.44	13 38.31	0.381
Wed.	31	20 57 3.69	10.205	17 15 44.8	42.27	16 16.14	68.33	13 47.04	0.348
Thur.	32	21 1 8.20	10.172	S. 16 58 41.1	+43.02	16 15.99	68.22	13 54.96	0.315

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^s.19$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, *to be subtracted from Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	18 48 57.88	11.031	S. 22 58 48.2	+12.90	4 0.22	1.175	18 44 57.66
Tues.	2	18 53 22.43	11.016	22 53 24.8	14.03	4 28.21	1.160	18 48 54.22
Wed.	3	18 57 46.64	11.000	22 47 34.2	15.17	4 55.86	1.144	18 52 50.78
Thur.	4	19 2 10.45	10.984	22 41 16.5	16.30	5 23.11	1.128	18 56 47.34
Frid.	5	19 6 33.86	10.966	22 34 31.8	17.42	5 49.96	1.110	19 0 43.90
Sat.	6	19 10 56.83	10.948	22 27 20.3	18.53	6 16.38	1.092	19 4 40.45
Sun.	7	19 15 19.35	10.928	22 19 42.2	19.63	6 42.34	1.072	19 8 37.01
Mon.	8	19 19 41.37	10.907	22 11 37.6	20.73	7 7.80	1.051	19 12 33.57
Tues.	9	19 24 2.87	10.884	22 3 6.9	21.82	7 32.75	1.028	19 16 30.13
Wed.	10	19 28 23.82	10.861	21 54 10.3	22.89	7 57.13	1.005	19 20 26.69
Thur.	11	19 32 44.21	10.837	21 44 48.1	23.95	8 20.96	0.981	19 24 23.25
Frid.	12	19 37 4.01	10.812	21 35 0.4	25.00	8 44.20	0.956	19 28 19.81
Sat.	13	19 41 23.19	10.785	21 24 47.6	26.04	9 6.82	0.929	19 32 16.37
Sun.	14	19 45 41.72	10.758	21 14 10.0	27.07	9 28.80	0.902	19 36 12.92
Mon.	15	19 49 59.59	10.729	21 3 8.0	28.09	9 50.11	0.873	19 40 9.48
Tues.	16	19 54 16.75	10.700	20 51 41.8	29.09	10 10.72	0.844	19 44 6.03
Wed.	17	19 58 33.22	10.670	20 39 51.8	30.07	10 30.63	0.814	19 48 2.59
Thur.	18	20 2 48.94	10.640	20 27 38.4	31.04	10 49.79	0.784	19 51 59.15
Frid.	19	20 7 3.93	10.608	20 15 1.9	31.99	11 8.22	0.752	19 55 55.71
Sat.	20	20 11 18.15	10.576	20 2 2.5	32.93	11 25.88	0.720	19 59 52.27
Sun.	21	20 15 31.58	10.543	19 48 40.9	33.86	11 42.75	0.687	20 3 48.83
Mon.	22	20 19 44.22	10.510	19 34 57.2	34.77	11 58.83	0.654	20 7 45.39
Tues.	23	20 23 56.06	10.476	19 20 51.8	35.67	12 14.11	0.620	20 11 41.95
Wed.	24	20 28 7.08	10.442	19 6 25.1	36.55	12 28.58	0.586	20 15 38.50
Thur.	25	20 32 17.29	10.408	18 51 37.4	37.41	12 42.23	0.552	20 19 35.06
Frid.	26	20 36 26.69	10.374	18 36 29.3	38.25	12 55.07	0.518	20 23 31.62
Sat.	27	20 40 35.27	10.340	18 21 1.2	39.08	13 7.09	0.484	20 27 28.18
Sun.	28	20 44 43.03	10.305	18 5 13.3	39.90	13 18.30	0.449	20 31 24.73
Mon.	29	20 48 49.96	10.271	17 49 6.0	40.70	13 28.67	0.415	20 35 21.29
Tues.	30	20 52 56.06	10.237	17 32 39.4	41.49	13 38.22	0.381	20 39 17.84
Wed.	31	20 57 1.35	10.204	17 15 54.4	42.26	13 46.95	0.348	20 43 14.40
Thur.	32	21 1 5.84	10.171	S. 16 58 51.1	+43.01	13 54.88	0.315	20 47 10.96

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

Diff. for 1 hour.
$+9^s.8565$

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	1	281 15 44.3	15 39.0	152.86	+0.29	9.9926311	+ 0.9	5 14 10.72
2	2	282 16 53.1	16 47.6	152.87	0.19	.9926347	2.1	5 10 14.81
3	3	283 18 2.1	17 56.4	152.87	+0.07	.9926411	3.2	5 6 18.90
4	4	284 19 11.2	19 5.3	152.88	−0.05	.9926501	4.3	5 2 22.99
5	5	285 20 20.4	20 14.3	152.88	0.18	.9926617	5.4	4 58 27.08
6	6	286 21 29.7	21 23.4	152.89	0.31	.9926758	6.4	4 54 31.17
7	7	287 22 39.1	22 32.6	152.89	0.42	.9926923	7.4	4 50 35.27
8	8	288 23 48.6	23 41.9	152.89	0.52	.9927110	8.3	4 46 39.34
9	9	289 24 58.0	24 51.2	152.89	0.59	.9927318	9.1	4 42 43.43
10	10	290 26 7.4	26 0.4	152.89	0.64	.9927546	9.8	4 38 47.52
11	11	291 27 16.7	27 9.5	152.89	0.64	.9927792	10.6	4 34 51.61
12	12	292 28 25.7	28 18.3	152.88	0.63	.9928056	11.4	4 30 55.69
13	13	293 29 34.4	29 26.8	152.86	0.58	.9928338	12.1	4 26 59.78
14	14	294 30 42.6	30 34.9	152.83	0.52	.9928636	12.7	4 23 3.87
15	15	295 31 50.4	31 42.5	152.80	0.42	.9928949	13.4	4 19 7.95
16	16	296 32 57.6	32 49.5	152.77	0.30	.9929278	14.0	4 15 12.05
17	17	297 34 4.1	33 55.8	152.74	0.17	.9929623	14.7	4 11 16.14
18	18	298 35 9.8	35 1.3	152.71	−0.04	.9929984	15.4	4 7 20.23
19	19	299 36 14.7	36 6.0	152.68	+0.09	.9930363	16.2	4 3 24.32
20	20	300 37 18.6	37 9.8	152.64	0.22	.9930760	17.0	3 59 28.39
21	21	301 38 21.4	38 12.4	152.60	0.33	.9931176	17.8	3 55 32.48
22	22	302 39 22.9	39 13.8	152.55	0.42	.9931612	18.7	3 51 36.57
23	23	303 40 23.5	40 14.1	152.51	0.47	.9932071	19.6	3 47 40.66
24	24	304 41 23.0	41 13.4	152.46	0.51	.9932553	20.5	3 43 44.75
25	25	305 42 21.4	42 11.7	152.41	0.52	.9933059	21.5	3 39 48.84
26	26	306 43 18.7	43 8.8	152.36	0.49	.9933590	22.6	3 35 52.93
27	27	307 44 14.8	44 4.7	152.31	0.43	.9934146	23.6	3 31 57.02
28	28	308 45 9.8	44 59.5	152.27	0.35	.9934727	24.7	3 28 1.10
29	29	309 46 3.8	45 53.4	152.23	0.25	.9935332	25.8	3 24 5.19
30	30	310 46 56.8	46 46.2	152.19	0.13	.9935962	27.0	3 20 9.28
31	31	311 47 48.7	47 38.0	152.15	+0.01	.9936618	28.0	3 16 13.37
32	32	312 48 39.6	48 28.7	152.10	−0.11	9.9937300	+28.9	3 12 17.46

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9s.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 42.6	16 39.5	61 13.2	−0.76	61 1.8	−1.14	14 16.8	2.41	16.7
2	16 35.2	16 30.0	60 46.1	1.46	60 26.9	1.73	15 11.9	2.19	17.7
3	16 24.0	16 17.4	60 4.8	1.94	59 40.5	2.10	16 2.4	2.01	18.7
4	16 10.3	16 3.0	59 14.6	2.20	58 47.8	2.25	16 49.6	1.92	19.7
5	15 55.6	15 48.4	58 20.8	2.24	57 54.1	2.21	17 35.2	1.89	20.7
6	15 41.3	15 34.5	57 28.0	2.13	57 3.0	2.03	18 20.6	1.90	21.7
7	15 28.0	15 22.0	56 39.4	1.91	56 17.3	1.77	19 6.8	1.96	22.7
8	15 16.5	15 11.4	55 56.9	1.63	55 38.2	1.49	19 54.8	2.04	23.7
9	15 6.8	15 2.6	55 21.1	1.35	55 5.8	1,21	20 44.8	2.12	24.7
10	14 58.9	14 55.6	54 52.1	1.07	54 40.1	0.94	21 36.5	2.17	25.7
11	14 52.8	14 50.3	54 29.6	0.81	54 20.7	0.68	22 28.7	2.17	26.7
12	14 48.3	14 46.6	54 13.2	0.57	54 7.1	0.45	23 20.2	2.11	27.7
13	14 45.3	14 44.4	54 2.3	0.35	53 58.8	0.24	☌		28.7
14	14 43.8	14 43.5	53 56.6	−0.13	53 55.6	−0.03	0 9.9	2.02	29.7
15	14 43.6	14 44.0	53 55.9	+0.08	53 57.5	+0.19	0 56.9	1.90	0.9
16	14 44.8	14 46.0	54 0.5	0.31	54 4.9	0.43	1 41.2	1.79	1.9
17	14 47.7	14 49.7	54 10.9	0.57	54 18.5	0.70	2 23.2	1.71	2.9
18	14 52.3	14 55.2	54 27.7	0.84	54 38.7	0.99	3 3.7	1.66	3.9
19	14 58.7	15 2.7	54 51.6	1.15	55 6.3	1.31	3 43.6	1.67	4.9
20	15 7.3	15 12.4	55 23.0	1.47	55 41.7	1.63	4 24.0	1.72	5.9
21	15 17.9	15 24.0	56 2.2	1.79	56 24.6	1.94	5 6.4	1.82	6.9
22	15 30.6	15 37.6	56 48.8	2.08	57 14.5	2.20	5 52.0	1.99	7.9
23	15 44.9	15 52.6	57 41.5	2.29	58 9.4	2.36	6 42.3	2.21	8.9
24	16 0.3	16 8.0	58 37.9	2.38	59 6.3	2.34	7 38.2	2.46	9.9
25	16 15.6	16 22.7	59 33.9	2.25	60 0.1	2.10	8 39.8	2.67	10.9
26	16 29.3	16 35.0	60 24.1	1.89	60 45.2	1.62	9 45.4	2.77	11.9
27	16 39.8	16 43.4	61 2.8	1.30	61 16.2	0.93	10 51.7	2.72	12.9
28	16 45.8	16 46.8	61 24.8	+0.51	61 28.4	+0.08	11 55.4	2.56	13.9
29	16 46.3	16 44.5	61 26.8	−0.35	61 20.1	−0.77	12 54.4	2.35	14.9
30	16 41.3	16 36.9	61 8.4	1.17	60 52.1	1.52	13 48.7	2.17	15.9
31	16 31.4	16 25.0	60 32.0	1.82	60 8.5	2.08	14 39.2	2.04	16.9
32	16 17.9	16 10.3	59 42.3	−2.27	59 14.3	−2.39	15 27.3	1.97	17.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 27 42.86	2.6048	N.22 23 53.8	11.611	0	10 23 2.44	2.2169	N.10 56 18.7	16.151
1	8 30 18.90	2.5963	22 12 12.6	11.761	1	10 25 15.26	2.2104	10 40 8.4	16.192
2	8 32 54.42	2.5878	22 0 22.5	11.908	2	10 27 27.69	2.2039	10 23 55.7	16.230
3	8 35 29.43	2.5792	21 48 23.6	12.054	3	10 29 39.73	2.1975	10 7 40.8	16.267
4	8 38 3.92	2.5705	21 36 16.0	12.197	4	10 31 51.39	2.1912	9 51 23.7	16.302
5	8 40 37.89	2.5619	21 24 0.0	12.337	5	10 34 2.67	2.1849	9 35 4.6	16.335
6	8 43 11.35	2.5533	21 11 35.6	12.476	6	10 36 13.58	2.1788	9 18 43.5	16.366
7	8 45 44.29	2.5447	20 59 2.9	12.612	7	10 38 24.13	2.1729	9 2 20.6	16.395
8	8 48 16.71	2.5360	20 46 22.2	12.744	8	10 40 34.33	2.1671	8 45 56.1	16.422
9	8 50 48.61	2.5272	20 33 33.6	12.875	9	10 42 44.18	2.1613	8 29 30.0	16.448
10	8 53 19.98	2.5185	20 20 37.2	13.003	10	10 44 53.69	2.1556	8 13 2.4	16.472
11	8 55 50.83	2.5098	20 7 33.2	13.130	11	10 47 2.86	2.1500	7 56 33.4	16.493
12	8 58 21.16	2.5012	19 54 21.6	13.254	12	10 49 11.69	2.1445	7 40 3.2	16.513
13	9 0 50.97	2.4924	19 41 2.7	13.375	13	10 51 20.20	2.1391	7 23 31.8	16.532
14	9 3 20.25	2.4837	19 27 36.6	13.493	14	10 53 28.39	2.1338	7 6 59.4	16.548
15	9 5 49.01	2.4750	19 14 3.5	13.609	15	10 55 36.26	2.1286	6 50 26.0	16.564
16	9 8 17.25	2.4664	19 0 23.5	13.723	16	10 57 43.82	2.1235	6 33 51.7	16.577
17	9 10 44.98	2.4578	18 46 36.7	13.835	17	10 59 51.08	2.1185	6 17 16.7	16.589
18	9 13 12.19	2.4492	18 32 43.3	13.944	18	11 1 58.04	2.1136	6 0 41.0	16.599
19	9 15 38.88	2.4406	18 18 43.5	14.050	19	11 4 4.71	2.1087	5 44 4.8	16.607
20	9 18 5.06	2.4321	18 4 37.3	14.155	20	11 6 11.09	2.1040	5 27 28.1	16.615
21	9 20 30.73	2.4236	17 50 24.9	14.257	21	11 8 17.19	2.0994	5 10 51.0	16.621
22	9 22 55.89	2.4151	17 36 6.5	14.356	22	11 10 23.02	2.0950	4 54 13.6	16.624
23	9 25 20.54	2.4066	N.17 21 42.2	14.453	23	11 12 28.59	2.0906	N. 4 37 36.1	16.626
	TUESDAY 2.					THURSDAY 4.			
0	9 27 44.68	2.3982	N.17 7 12.1	14.548	0	11 14 33.90	2.0863	N. 4 20 58.5	16.627
1	9 30 8.32	2.3899	16 52 36.4	14.640	1	11 16 38.95	2.0821	4 4 20.9	16.626
2	9 32 31.47	2.3817	16 37 55.3	14.730	2	11 18 43.75	2.0780	3 47 43.4	16.624
3	9 34 54.13	2.3735	16 23 8.8	14.818	3	11 20 48.31	2.0740	3 31 6.0	16.621
4	9 37 16.29	2.3653	16 8 17.1	14.903	4	11 22 52.63	2.0701	3 14 28.9	16.616
5	9 39 37.96	2.3572	15 53 20.4	14.986	5	11 24 56.72	2.0662	2 57 52.1	16.609
6	9 41 59.15	2.3492	15 38 18.8	15.067	6	11 27 0.58	2.0625	2 41 15.8	16.601
7	9 44 19.86	2.3412	15 23 12.4	15.146	7	11 29 4.22	2.0589	2 24 40.0	16.592
8	9 46 40.09	2.3332	15 8 1.3	15.223	8	11 31 7.65	2.0554	2 8 4.8	16.581
9	9 48 59.84	2.3253	14 52 45.7	15.297	9	11 33 10.87	2.0520	1 51 30.3	16.568
10	9 51 19.12	2.3175	14 37 25.7	15.368	10	11 35 13.89	2.0488	1 34 56.6	16.555
11	9 53 37.94	2.3099	14 22 1.5	15.437	11	11 37 16.72	2.0456	1 18 23.7	16.541
12	9 55 56.31	2.3023	14 6 33.2	15.505	12	11 39 19.36	2.0424	1 1 51.7	16.525
13	9 58 14.22	2.2947	13 51 0.9	15.571	13	11 41 21.81	2.0393	0 45 20.7	16.507
14	10 0 31.67	2.2871	13 35 24.7	15.634	14	11 43 24.08	2.0364	0 28 50.9	16.488
15	10 2 48.67	2.2797	13 19 44.8	15.696	15	11 45 26.18	2.0337	N. 0 12 22.2	16.468
16	10 5 5.23	2.2724	13 4 1.3	15.754	16	11 47 28.12	2.0310	S. 0 4 5.3	16.447
17	10 7 21.36	2.2652	12 48 14.3	15.811	17	11 49 29.90	2.0283	0 20 31.4	16.424
18	10 9 37.06	2.2581	12 32 24.0	15.866	18	11 51 31.52	2.0258	0 36 56.1	16.400
19	10 11 52.33	2.2509	12 16 30.4	15.918	19	11 53 32.99	2.0234	0 53 19.4	16.375
20	10 14 7.17	2.2439	12 0 33.8	15.968	20	11 55 34.32	2.0211	1 9 41.1	16.348
21	10 16 21.60	2.2371	11 44 34.2	16.017	21	11 57 35.52	2.0188	1 26 1.2	16.321
22	10 18 35.62	2.2303	11 28 31.7	16.064	22	11 59 36.58	2.0166	1 42 19.6	16.292
23	10 20 49.23	2.2235	11 12 26.5	16.108	23	12 1 37.51	2.0145	1 58 36.2	16.262
24	10 23 2.44	2.2169	N.10 56 18.7	16.151	24	12 3 38.32	2.0126	S. 2 14 51.0	16.231

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 3 38.32	2.0126	S. 2 14 51.0	16.231
1	12 5 39.02	2.0108	2 31 3.9	16.198
2	12 7 39.61	2.0090	2 47 14.8	16.165
3	12 9 40.10	2.0073	3 3 23.7	16.131
4	12 11 40.49	2.0057	3 19 30.5	16.095
5	12 13 40.78	2.0041	3 35 35.1	16.058
6	12 15 40.98	2.0027	3 51 37.5	16.021
7	12 17 41.10	2.0014	4 7 37.6	15.982
8	12 19 41.15	2.0002	4 23 35.3	15.941
9	12 21 41.13	1.9991	4 39 30.5	15.899
10	12 23 41.04	1.9980	4 55 23.2	15.857
11	12 25 40.89	1.9971	5 11 13.4	15.815
12	12 27 40.69	1.9962	5 27 1.0	15.771
13	12 29 40.44	1.9954	5 42 45.9	15.725
14	12 31 40.14	1.9948	5 58 28.0	15.678
15	12 33 39.81	1.9942	6 14 7.3	15.631
16	12 35 39.44	1.9936	6 29 43.7	15.582
17	12 37 39.04	1.9931	6 45 17.2	15.532
18	12 39 38.61	1.9927	7 0 47.6	15.481
19	12 41 38.16	1.9924	7 16 14.9	15.430
20	12 43 37.70	1.9923	7 31 39.2	15.378
21	12 45 37.24	1.9923	7 47 0.3	15.324
22	12 47 36.78	1.9922	8 2 18.1	15.270
23	12 49 36.31	1.9922	S. 8 17 32.7	15.215

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 51 35.84	1.9923	S. 8 32 43.9	15.158
1	12 53 35.38	1.9925	8 47 51.7	15.101
2	12 55 34.94	1.9928	9 2 56.0	15.043
3	12 57 34.52	1.9932	9 17 56.8	14.983
4	12 59 34.13	1.9937	9 32 54.0	14.923
5	13 1 33.77	1.9942	9 47 47.5	14.861
6	13 3 33.44	1.9948	10 2 37.3	14.798
7	13 5 33.15	1.9955	10 17 23.3	14.736
8	13 7 32.90	1.9962	10 32 5.6	14.673
9	13 9 32.69	1.9969	10 46 44.0	14.608
10	13 11 32.53	1.9978	11 1 18.5	14.542
11	13 13 32.43	1.9989	11 15 49.0	14.475
12	13 15 32.40	2.0000	11 30 15.5	14.407
13	13 17 32.43	2.0010	11 44 37.9	14.339
14	13 19 32.52	2.0021	11 58 56.2	14.269
15	13 21 32.68	2.0033	12 13 10.2	14.198
16	13 23 32.92	2.0047	12 27 20.0	14.127
17	13 25 33.25	2.0062	12 41 25.5	14.055
18	13 27 33.66	2.0076	12 55 26.6	13.982
19	13 29 34.16	2.0091	13 9 23.3	13.908
20	13 31 34.75	2.0106	13 23 15.6	13.834
21	13 33 35.43	2.0123	13 37 3.4	13.759
22	13 35 36.22	2.0140	13 50 46.7	13.682
23	13 37 37.11	2.0157	14 4 25.3	13.604
24	13 39 38.10	2.0174	S. 14 17 59.2	13.526

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 39 38.10	2.0174	S. 14 17 59.2	13.526
1	13 41 39.20	2.0193	14 31 28.4	13.447
2	13 43 40.42	2.0213	14 44 52.9	13.367
3	13 45 41.76	2.0233	14 58 12.5	13.286
4	13 47 43.22	2.0253	15 11 27.2	13.204
5	13 49 44.80	2.0274	15 24 37.0	13.122
6	13 51 46.51	2.0296	15 37 41.9	13.039
7	13 53 48.35	2.0318	15 50 41.7	12.954
8	13 55 50.33	2.0341	16 3 36.4	12.869
9	13 57 52.44	2.0363	16 16 26.0	12.783
10	13 59 54.69	2.0387	16 29 10.4	12.697
11	14 1 57.08	2.0411	16 41 49.6	12.610
12	14 3 59.62	2.0436	16 54 23.6	12.522
13	14 6 2.31	2.0461	17 6 52.2	12.432
14	14 8 5.15	2.0486	17 19 15.4	12.342
15	14 10 8.14	2.0512	17 31 33.2	12.252
16	14 12 11.29	2.0538	17 43 45.6	12.160
17	14 14 14.60	2.0565	17 55 52.4	12.067
18	14 16 18.07	2.0592	18 7 53.6	11.973
19	14 18 21.71	2.0620	18 19 49.2	11.880
20	14 20 25.51	2.0647	18 31 39.2	11.785
21	14 22 29.48	2.0675	18 43 23.4	11.689
22	14 24 33.61	2.0703	18 55 1.8	11.593
23	14 26 37.91	2.0732	S. 19 6 34.5	11.496

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 28 42.39	2.0762	S. 19 18 1.3	11.397
1	14 30 47.05	2.0792	19 29 22.2	11.298
2	14 32 51.89	2.0821	19 40 37.1	11.198
3	14 34 56.90	2.0850	19 51 46.0	11.097
4	14 37 2.09	2.0881	20 2 48.8	10.996
5	14 39 7.47	2.0912	20 13 45.5	10.894
6	14 41 13.03	2.0943	20 24 36.1	10.792
7	14 43 18.78	2.0974	20 35 20.5	10.688
8	14 45 24.72	2.1005	20 45 58.6	10.583
9	14 47 30.84	2.1036	20 56 30.4	10.478
10	14 49 37.15	2.1067	21 6 55.9	10.372
11	14 51 43.64	2.1098	21 17 15.0	10.264
12	14 53 50.32	2.1130	21 27 27.6	10.156
13	14 55 57.20	2.1162	21 37 33.7	10.048
14	14 58 4.27	2.1194	21 47 33.4	9.940
15	15 0 11.53	2.1226	21 57 26.5	9.829
16	15 2 18.98	2.1258	22 7 12.9	9.718
17	15 4 26.62	2.1290	22 16 52.7	9.607
18	15 6 34.46	2.1322	22 26 25.8	9.495
19	15 8 42.49	2.1354	22 35 52.1	9.382
20	15 10 50.71	2.1387	22 45 11.7	9.269
21	15 12 59.13	2.1419	22 54 24.4	9.154
22	15 15 7.74	2.1451	23 3 30.2	9.039
23	15 17 16.54	2.1482	23 12 29.1	8.923
24	15 19 25.53	2.1514	S. 23 21 21.0	8.807

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 19 25.53	2.1514	S.23 21 21.0	8.807	0	17 5 49.98	2.2631	S.27 58 4.0	2.533
1	15 21 34.71	2.1547	23 30 5.9	8.689	1	17 8 5.79	2.2639	28 0 31.8	2.393
2	15 23 44.09	2.1579	23 38 43.7	8.572	2	17 10 21.65	2.2647	28 2 51.2	2.252
3	15 25 53.66	2.1611	23 47 14.5	8.453	3	17 12 37.55	2.2653	28 5 2.1	2.112
4	15 28 3.42	2.1642	23 55 38.1	8.333	4	17 14 53.49	2.2659	28 7 4.6	1.972
5	15 30 13.36	2.1673	24 3 54.5	8.213	5	17 17 9.46	2.2664	28 8 58.7	1.831
6	15 32 23.49	2.1704	24 12 3.7	8.093	6	17 19 25.46	2.2668	28 10 44.3	1.690
7	15 34 33.81	2.1735	24 20 5.6	7.972	7	17 21 41.48	2.2671	28 12 21.5	1.549
8	15 36 44.31	2.1765	24 28 0.3	7.850	8	17 23 57.51	2.2673	28 13 50.2	1.408
9	15 38 54.99	2.1796	24 35 47.6	7.727	9	17 26 13.55	2.2674	28 15 10.4	1.267
10	15 41 5.86	2.1827	24 43 27.5	7.603	10	17 28 29.60	2.2675	28 16 22.2	1.126
11	15 43 16.92	2.1856	24 51 0.0	7.479	11	17 30 45.65	2.2674	28 17 25.5	0.984
12	15 45 28.16	2.1886	24 58 25.0	7.354	12	17 33 1.69	2.2673	28 18 20.3	0.843
13	15 47 39.57	2.1917	25 5 42.5	7.229	13	17 35 17.72	2.2671	28 19 6.7	0.702
14	15 49 51.16	2.1946	25 12 52.5	7.103	14	17 37 33.74	2.2668	28 19 44.6	0.561
15	15 52 2.92	2.1974	25 19 54.9	6.977	15	17 39 49.74	2.2664	28 20 14.0	0.420
16	15 54 14.85	2.2003	25 26 49.7	6.850	16	17 42 5.71	2.2659	28 20 35.0	0.280
17	15 56 26.95	2.2031	25 33 36.9	6.722	17	17 44 21.65	2.2653	28 20 47.6	−0.139
18	15 58 39.22	2.2059	25 40 16.4	6.594	18	17 46 37.55	2.2647	28 20 51.7	+0.002
19	16 0 51.66	2.2087	25 46 48.2	6.465	19	17 48 53.41	2.2640	28 20 47.4	0.142
20	16 3 4.26	2.2114	25 53 12.2	6.336	20	17 51 9.23	2.2632	28 20 34.6	0.283
21	16 5 17.02	2.2140	25 59 28.5	6.207	21	17 53 24.99	2.2622	28 20 13.4	0.423
22	16 7 29.94	2.2166	26 5 37.0	6.076	22	17 55 40.69	2.2612	28 19 43.8	0.563
23	16 9 43.01	2.2191	S.26 11 37.6	5.944	23	17 57 56.33	2.2601	S.28 19 5.8	0.703
WEDNESDAY 10.					FRIDAY 12.				
0	16 11 56.23	2.2216	S.26 17 30.3	5.813	0	18 0 11.90	2.2589	S.28 18 19.4	0.842
1	16 14 9.60	2.2241	26 23 15.1	5.681	1	18 2 27.39	2.2576	28 17 24.7	0.982
2	16 16 23.12	2.2265	26 28 52.0	5.548	2	18 4 42.81	2.2563	28 16 21.6	1.122
3	16 18 36.78	2.2288	26 34 20.9	5.415	3	18 6 58.15	2.2549	28 15 10.1	1.261
4	16 20 50.58	2.2311	26 39 41.8	5.282	4	18 9 13.40	2.2533	28 13 50.3	1.399
5	16 23 4.51	2.2334	26 44 54.7	5.148	5	18 11 28.55	2.2517	28 12 22.2	1.538
6	16 25 18.58	2.2356	26 49 59.6	5.014	6	18 13 43.60	2.2499	28 10 45.8	1.676
7	16 27 32.78	2.2377	26 54 56.4	4.879	7	18 15 58.54	2.2482	28 9 1.1	1.813
8	16 29 47.10	2.2397	26 59 45.1	4.743	8	18 18 13.38	2.2463	28 7 8.2	1.950
9	16 32 1.54	2.2417	27 4 25.6	4.608	9	18 20 28.10	2.2443	28 5 7.1	2.087
10	16 34 16.10	2.2437	27 8 58.0	4.472	10	18 22 42.70	2.2423	28 2 57.8	2.223
11	16 36 30.78	2.2455	27 13 22.2	4.335	11	18 24 57.18	2.2402	28 0 40.3	2.360
12	16 38 45.56	2.2473	27 17 38.2	4.198	12	18 27 11.53	2.2380	27 58 14.6	2.496
13	16 41 0.45	2.2490	27 21 46.0	4.061	13	18 29 25.74	2.2357	27 55 40.8	2.632
14	16 43 15.44	2.2507	27 25 45.5	3.923	14	18 31 39.81	2.2333	27 52 58.8	2.767
15	16 45 30.53	2.2523	27 29 36.8	3.786	15	18 33 53.74	2.2310	27 50 8.8	2.901
16	16 47 45.71	2.2538	27 33 19.8	3.648	16	18 36 7.53	2.2285	27 47 10.7	3.035
17	16 50 0.98	2.2553	27 36 54.5	3.510	17	18 38 21.17	2.2260	27 44 4.6	3.168
18	16 52 16.34	2.2566	27 40 21.0	3.372	18	18 40 34.65	2.2233	27 40 50.6	3.300
19	16 54 31.77	2.2578	27 43 39.1	3.232	19	18 42 47.97	2.2206	27 37 28.6	3.433
20	16 56 47.28	2.2591	27 46 48.8	3.092	20	18 45 1.12	2.2178	27 33 58.6	3.566
21	16 59 2.86	2.2603	27 49 50.2	2.953	21	18 47 14.10	2.2149	27 30 20.7	3.697
22	17 1 18.51	2.2613	27 52 43.2	2.813	22	18 49 26.91	2.2120	27 26 35.0	3.828
23	17 3 34.22	2.2622	27 55 27.8	2.673	23	18 51 39.54	2.2089	27 22 41.4	3.958
24	17 5 49.98	2.2631	S.27 58 4.0	2.533	24	18 53 51.98	2.2058	S 27 18 40.0	4.087

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 53 51.98	2.2058	S.27 18 40.0	4.087
1	18 56 4.24	2.2037	27 14 30.9	4.217
2	18 58 16.31	2.1996	27 10 14.0	4.346
3	19 0 28.19	2.1963	27 5 49.4	4.474
4	19 2 39.87	2.1930	27 1 17.1	4.602
5	19 4 51.35	2.1897	26 56 37.2	4.728
6	19 7 2.63	2.1862	26 51 49.8	4.853
7	19 9 13.70	2.1827	26 46 54.8	4.979
8	19 11 24.55	2.1791	26 41 52.3	5.104
9	19 13 35.19	2.1756	26 36 42.3	5.228
10	19 15 45.62	2.1720	26 31 24.9	5.351
11	19 17 55.83	2.1683	26 26 0.2	5.473
12	19 20 5.81	2.1645	26 20 28.1	5.596
13	19 22 15.57	2.1607	26 14 48.7	5.718
14	19 24 25.10	2.1568	26 9 2.0	5.838
15	19 26 34.39	2.1529	26 3 8.1	5.957
16	19 28 43.45	2.1491	25 57 7.1	6.076
17	19 30 52.28	2.1452	25 50 59.0	6.194
18	19 33 0.87	2.1412	25 44 43.8	6.312
19	19 35 9.22	2.1371	25 38 21.6	6.428
20	19 37 17.32	2.1330	25 31 52.4	6.545
21	19 39 25.18	2.1289	25 25 16.2	6.661
22	19 41 32.79	2.1248	25 18 33.1	6.775
23	19 43 40.15	2.1207	S.25 11 43.2	6.888

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 45 47.27	2.1165	S.25 4 46.6	7.000
1	19 47 54.13	2.1122	24 57 43.2	7.112
2	19 50 0.74	2.1080	24 50 33.1	7.223
3	19 52 7.09	2.1037	24 43 16.4	7.333
4	19 54 13.18	2.0993	24 35 53.1	7.443
5	19 56 19.01	2.0951	24 28 23.2	7.552
6	19 58 24.59	2.0908	24 20 46.8	7.660
7	20 0 29.91	2.0864	24 13 4.0	7.767
8	20 2 34.96	2.0820	24 5 14.8	7.873
9	20 4 39.75	2.0777	23 57 19.3	7.978
10	20 6 44.28	2.0733	23 49 17.5	8.083
11	20 8 48.54	2.0688	23 41 9.4	8.186
12	20 10 52.54	2.0644	23 32 55.2	8.288
13	20 12 56.27	2.0600	23 24 34.9	8.390
14	20 14 59.74	2.0557	23 16 8.4	8.492
15	20 17 2.95	2.0513	23 7 35.9	8.592
16	20 19 5.89	2.0468	22 58 57.4	8.691
17	20 21 8.56	2.0423	22 50 13.0	8.789
18	20 23 10.97	2.0379	22 41 22.7	8.887
19	20 25 13.11	2.0335	22 32 26.6	8.983
20	20 27 14.99	2.0291	22 23 24.8	9.078
21	20 29 16.60	2.0247	22 14 17.2	9.174
22	20 31 17.95	2.0202	22 5 3.9	9.268
23	20 33 19.03	2.0158	21 55 45.1	9.360
24	20 35 19.85	2.0114	S.21 46 20.7	9.452

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 35 19.85	2.0114	S.21 46 20.7	9.452
1	20 37 20.40	2.0070	21 36 50.8	9.544
2	20 39 20.69	2.0027	21 27 15.4	9.634
3	20 41 20.72	1.9984	21 17 34.7	9.723
4	20 43 20.49	1.9940	21 7 48.6	9.812
5	20 45 20.00	1.9897	20 57 57.2	9.900
6	20 47 19.25	1.9853	20 48 0.6	9.987
7	20 49 18.24	1.9810	20 37 58.8	10.073
8	20 51 16.97	1.9767	20 27 51.9	10.158
9	20 53 15.45	1.9725	20 17 39.8	10.243
10	20 55 13.67	1.9683	20 7 22.7	10.326
11	20 57 11.64	1.9641	19 57 0.7	10.408
12	20 59 9.36	1.9599	19 46 33.8	10.489
13	21 1 6.83	1.9557	19 36 2.0	10.570
14	21 3 4.05	1.9516	19 25 25.4	10.650
15	21 5 1.02	1.9474	19 14 44.0	10.729
16	21 6 57.74	1.9433	19 3 57.9	10.807
17	21 8 54.22	1.9393	18 53 7.2	10.883
18	21 10 50.46	1.9353	18 42 11.9	10.960
19	21 12 46.46	1.9313	18 31 12.0	11.036
20	21 14 42.22	1.9274	18 20 7.6	11.110
21	21 16 37.75	1.9236	18 8 58.8	11.183
22	21 18 33.05	1.9197	17 57 45.6	11.256
23	21 20 28.11	1.9158	S.17 46 28.0	11.328

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 22 22.94	1.9119	S.17 35 6.2	11.399
1	21 24 17.54	1.9082	17 23 40.1	11.470
2	21 26 11.92	1.9045	17 12 9.8	11.539
3	21 28 6.08	1.9008	17 0 35.4	11.607
4	21 30 0.02	1.8972	16 48 56.9	11.675
5	21 31 53.74	1.8936	16 37 14.4	11.742
6	21 33 47.25	1.8900	16 25 27.9	11.808
7	21 35 40.54	1.8864	16 13 37.5	11.873
8	21 37 33.62	1.8830	16 1 43.2	11.938
9	21 39 26.50	1.8796	15 49 45.0	12.002
10	21 41 19.17	1.8762	15 37 43.0	12.064
11	21 43 11.64	1.8728	15 25 37.3	12.125
12	21 45 3.91	1.8696	15 13 28.0	12.186
13	21 46 55.99	1.8663	15 1 15.0	12.247
14	21 48 47.87	1.8631	14 48 58.4	12.306
15	21 50 39.56	1.8599	14 36 38.3	12.364
16	21 52 31.06	1.8568	14 24 14.7	12.422
17	21 54 22.38	1.8538	14 11 47.7	12.478
18	21 56 13.52	1.8509	13 59 17.3	12.534
19	21 58 4.49	1.8480	13 46 43.6	12.590
20	21 59 55.28	1.8451	13 34 6.5	12.645
21	22 1 45.90	1.8423	13 21 26.2	12.698
22	22 3 36.35	1.8395	13 8 42.7	12.751
23	22 5 26.64	1.8368	12 55 56.0	12.803
24	22 7 16.77	1.8342	S.12 43 6.3	12.854

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 17.					**FRIDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 7 16.77	1.8342	S. 12 43 6.3	12.854	0	23 33 26.66	1.7823	S. 1 41 29.8	14.428
1	22 9 6.74	1.8315	12 30 13.5	12.905	1	23 35 13.62	1.7831	1 27 3.7	14.443
2	22 10 56.55	1.8289	12 17 17.7	12.954	2	23 37 0.63	1.7838	1 12 36.7	14.457
3	22 12 46.21	1.8265	12 4 19.0	13.003	3	23 38 47.68	1.7846	0 58 8.9	14.469
4	22 14 35.73	1.8241	11 51 17.4	13.052	4	23 40 34.78	1.7855	0 43 40.4	14.482
5	22 16 25.10	1.8217	11 38 12.8	13.100	5	23 42 21.94	1.7865	0 29 11.1	14.494
6	22 18 14.33	1.8194	11 25 5.4	13.146	6	23 44 9.16	1.7876	0 14 41.1	14.505
7	22 20 3.43	1.8172	11 11 55.3	13.192	7	23 45 56.45	1.7887	S. 0 0 10.5	14.516
8	22 21 52.39	1.8149	10 58 42.4	13.237	8	23 47 43.81	1.7900	N. 0 14 20.7	14.525
9	22 23 41.22	1.8127	10 45 26.9	13.280	9	23 49 31.25	1.7913	0 28 52.5	14.534
10	22 25 29.92	1.8107	10 32 8.8	13.324	10	23 51 18.77	1.7927	0 43 24.8	14.542
11	22 27 18.50	1.8087	10 18 48.0	13.367	11	23 53 6.37	1.7941	0 57 57.5	14.548
12	22 29 6.97	1.8068	10 5 24.7	13.409	12	23 54 54.06	1.7957	1 12 30.6	14.555
13	22 30 55.32	1.8049	9 51 58.9	13.451	13	23 56 41.85	1.7973	1 27 4.1	14.561
14	22 32 43.56	1.8031	9 38 30.6	13.491	14	23 58 29.74	1.7991	1 41 37.9	14.566
15	22 34 31.69	1.8013	9 25 0.0	13.530	15	0 0 17.74	1.8009	1 56 12.0	14.570
16	22 36 19.72	1.7997	9 11 27.0	13.569	16	0 2 5.85	1.8028	2 10 46.3	14.573
17	22 38 7.65	1.7980	8 57 51.7	13.607	17	0 3 54.07	1.8047	2 25 20.8	14.576
18	22 39 55.48	1.7964	8 44 14.1	13.645	18	0 5 42.41	1.8067	2 39 55.4	14.578
19	22 41 43.22	1.7950	8 30 34.3	13.682	19	0 7 30.88	1.8089	2 54 30.1	14.579
20	22 43 30.88	1.7936	8 16 52.3	13.718	20	0 9 19.48	1.8111	3 9 4.9	14.579
21	22 45 18.45	1.7922	8 3 8.2	13.753	21	0 11 8.21	1.8133	3 23 39.6	14.578
22	22 47 5.94	1.7909	7 49 22.0	13.788	22	0 12 57.08	1.8157	3 38 14.2	14.577
23	22 48 53.36	1.7897	S. 7 35 33.7	13.821	23	0 14 46.10	1.8182	N. 3 52 48.8	14.575
	THURSDAY 18.					**SATURDAY 20.**			
0	22 50 40.71	1.7886	S. 7 21 43.4	13.854	0	0 16 35.28	1.8209	N. 4 7 23.2	14.572
1	22 52 27.99	1.7875	7 7 51.2	13.886	1	0 18 24.61	1.8235	4 21 57.4	14.568
2	22 54 15.21	1.7865	6 53 57.0	13.918	2	0 20 14.10	1.8263	4 36 31.3	14.563
3	22 56 2.37	1.7855	6 40 1.0	13.948	3	0 22 3.76	1.8291	4 51 4.9	14.558
4	22 57 49.47	1.7846	6 26 3.2	13.979	4	0 23 53.59	1.8319	5 5 38.2	14.551
5	22 59 36.52	1.7838	6 12 3.5	14.009	5	0 25 43.59	1.8348	5 20 11.0	14.543
6	23 1 23.53	1.7831	5 58 2.1	14.037	6	0 27 33.77	1.8379	5 34 43.4	14.536
7	23 3 10.49	1.7823	5 43 59.0	14.065	7	0 29 24.14	1.8411	5 49 15.3	14.527
8	23 4 57.41	1.7817	5 29 54.3	14.092	8	0 31 14.70	1.8443	6 3 46.6	14.517
9	23 6 44.30	1.7812	5 15 48.0	14.118	9	0 33 5.46	1.8477	6 18 17.3	14.506
10	23 8 31.16	1.7808	5 1 40.1	14.144	10	0 34 56.42	1.8511	6 32 47.3	14.494
11	23 10 18.00	1.7805	4 47 30.7	14.169	11	0 36 47.59	1.8547	6 47 16.5	14.481
12	23 12 4.82	1.7802	4 33 19.8	14.193	12	0 38 38.98	1.8583	7 1 45.0	14.468
13	23 13 51.62	1.7799	4 19 7.5	14.217	13	0 40 30.59	1.8620	7 16 12.7	14.453
14	23 15 38.41	1.7797	4 4 53.8	14.240	14	0 42 22.42	1.8657	7 30 39.4	14.438
15	23 17 25.19	1.7797	3 50 38.7	14.262	15	0 44 14.47	1.8695	7 45 5.2	14.422
16	23 19 11.97	1.7797	3 36 22.3	14.283	16	0 46 6.76	1.8735	7 59 30.0	14.404
17	23 20 58.75	1.7798	3 22 4.7	14.303	17	0 47 59.29	1.8775	8 13 53.7	14.386
18	23 22 45.54	1.7799	3 7 45.9	14.323	18	0 49 52.06	1.8816	8 28 16.3	14.367
19	23 24 32.34	1.7801	2 53 25.9	14.343	19	0 51 45.08	1.8858	8 42 37.7	14.347
20	23 26 19.15	1.7804	2 39 4.7	14.362	20	0 53 38.36	1.8902	8 56 57.9	14.326
21	23 28 5.99	1.7808	2 24 42.5	14.379	21	0 55 31.90	1.8946	9 11 16.8	14.303
22	23 29 52.85	1.7812	2 10 19.3	14.396	22	0 57 25.71	1.8992	9 25 34.3	14.280
23	23 31 39.74	1.7817	1 55 55.0	14.413	23	0 59 19.80	1.9038	9 39 50.4	14.256
24	23 33 26.66	1.7823	S. 1 41 29.8	14.428	24	1 1 14.17	1.9085	N. 9 54 5.0	14.231

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 1 14.17	1.9085	N. 9 54 5.0	14.231
1	1 3 8.82	1.9132	10 8 18.1	14.205
2	1 5 3.75	1.9180	10 22 29.6	14.177
3	1 6 58.98	1.9230	10 36 39.4	14.149
4	1 8 54.51	1.9280	10 50 47.5	14.120
5	1 10 50.34	1.9331	11 4 53.8	14.089
6	1 12 46.48	1.9383	11 18 58.2	14.057
7	1 14 42.94	1.9437	11 33 0.7	14.025
8	1 16 39.72	1.9491	11 47 1.2	13.992
9	1 18 36.83	1.9546	12 0 59.7	13.957
10	1 20 34.27	1.9601	12 14 56.0	13.920
11	1 22 32.04	1.9657	12 28 50.1	13.883
12	1 24 30.15	1.9714	12 42 42.0	13.845
13	1 26 28.61	1.9773	12 56 31.5	13.805
14	1 28 27.43	1.9833	13 10 18.6	13.765
15	1 30 26.61	1.9893	13 24 3.3	13.723
16	1 32 26.15	1.9954	13 37 45.4	13.679
17	1 34 26.06	2.0017	13 51 24.8	13.635
18	1 36 26.35	2.0081	14 5 1.6	13.590
19	1 38 27.03	2.0145	14 18 35.6	13.543
20	1 40 28.09	2.0209	14 32 6.7	13.494
21	1 42 29.54	2.0274	14 45 34.9	13.445
22	1 44 31.38	2.0340	14 59 0.1	13.394
23	1 46 33.62	2.0407	N.15 12 22.2	13.342

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 48 36.27	2.0476	N.15 25 41.2	13.289
1	1 50 39.33	2.0545	15 38 56.9	13.234
2	1 52 42.81	2.0616	15 52 9.3	13.177
3	1 54 46.72	2.0687	16 5 18.2	13.119
4	1 56 51.05	2.0758	16 18 23.6	13.061
5	1 58 55.81	2.0830	16 31 25.5	13.001
6	2 1 1.01	2.0903	16 44 23.7	12.939
7	2 3 6.65	2.0977	16 57 18.2	12.876
8	2 5 12.73	2.1051	17 10 8.8	12.810
9	2 7 19.26	2.1127	17 22 55.4	12.743
10	2 9 26.25	2.1203	17 35 38.0	12.676
11	2 11 33.70	2.1281	17 48 16.5	12.607
12	2 13 41.62	2.1359	18 0 50.8	12.536
13	2 15 50.01	2.1438	18 13 20.8	12.464
14	2 17 58.87	2.1517	18 25 46.5	12.390
15	2 20 8.21	2.1597	18 38 7.6	12.313
16	2 22 18.03	2.1678	18 50 24.1	12.236
17	2 24 28.34	2.1760	19 2 36.0	12.158
18	2 26 39.15	2.1842	19 14 43.1	12.078
19	2 28 50.45	2.1925	19 26 45.3	11.996
20	2 31 2.25	2.2008	19 38 42.6	11.912
21	2 33 14.55	2.2092	19 50 34.8	11.827
22	2 35 27.36	2.2177	20 2 21.8	11.739
23	2 37 40.68	2.2263	20 14 3.5	11.651
24	2 39 54.52	2.2349	N.20 25 39.9	11.561

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	2 39 54.52	2.2349	N.20 25 39.9	11.561
1	2 42 8.87	2.2436	20 37 10.8	11.468
2	2 44 23.75	2.2523	20 48 36.1	11.374
3	2 46 39.15	2.2610	20 59 55.7	11.279
4	2 48 55.07	2.2698	21 11 9.6	11.182
5	2 51 11.52	2.2787	21 22 17.5	11.082
6	2 53 28.51	2.2876	21 33 19.4	10.981
7	2 55 46.03	2.2965	21 44 15.2	10.878
8	2 58 4.09	2.3055	21 55 4.8	10.773
9	3 0 22.69	2.3145	22 5 48.0	10.667
10	3 2 41.83	2.3236	22 16 24.8	10.558
11	3 5 1.52	2.3327	22 26 55.0	10.448
12	3 7 21.75	2.3418	22 37 18.6	10.337
13	3 9 42.53	2.3509	22 47 35.4	10.223
14	3 12 3.86	2.3601	22 57 45.3	10.106
15	3 14 25.74	2.3693	23 7 48.1	9.988
16	3 16 48.17	2.3786	23 17 43.8	9.868
17	3 19 11.16	2.3878	23 27 32.2	9.746
18	3 21 34.70	2.3969	23 37 13.3	9.622
19	3 23 58.79	2.4062	23 46 46.9	9.497
20	3 26 23.44	2.4154	23 56 12.9	9.369
21	3 28 48.64	2.4247	24 5 31.2	9.240
22	3 31 14.40	2.4339	24 14 41.7	9.108
23	3 33 40.71	2.4431	N.24 23 44.2	8.975

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	3 36 7.57	2.4523	N.24 32 38.7	8.840
1	3 38 34.98	2.4615	24 41 25.0	8.703
2	3 41 2.95	2.4707	24 50 3.0	8.563
3	3 43 31.47	2.4798	24 58 32.5	8.421
4	3 46 0.53	2.4889	25 6 53.5	8.278
5	3 48 30.14	2.4981	25 15 5.8	8.133
6	3 51 0.30	2.5072	25 23 9.4	7.986
7	3 53 31.00	2.5162	25 31 4.1	7.836
8	3 56 2.24	2.5251	25 38 49.7	7.684
9	3 58 34.01	2.5340	25 46 26.2	7.532
10	4 1 6.32	2.5429	25 53 53.5	7.377
11	4 3 39.16	2.5517	26 1 11.4	7.219
12	4 6 12.53	2.5605	26 8 19.8	7.060
13	4 8 46.42	2.5692	26 15 18.6	6.899
14	4 11 20.83	2.5778	26 22 7.7	6.737
15	4 13 55.75	2.5863	26 28 47.0	6.572
16	4 16 31.18	2.5948	26 35 16.3	6.404
17	4 19 7.12	2.6031	26 41 35.5	6.236
18	4 21 43.55	2.6113	26 47 44.6	6.066
19	4 24 20.47	2.6194	26 53 43.4	5.893
20	4 26 57.88	2.6275	26 59 31.8	5.718
21	4 29 35.77	2.6355	27 5 9.6	5.542
22	4 32 14.14	2.6434	27 10 36.8	5.364
23	4 34 52.98	2.6512	27 15 53.3	5.185
24	4 37 32.28	2.6588	N.27 20 59.0	5.004

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 37 32.28	2.6588	N.27 20 59.0	5.004	0	6 50 38.81	2.8077	N.27 27 23.1	5.012
1	4 40 12.03	2.6663	27 25 53.8	4.821	1	6 53 27.21	2.8055	27 22 15.9	5.227
2	4 42 52.23	2.6736	27 30 37.5	4.635	2	6 56 15.47	2.8032	27 16 55.9	5.441
3	4 45 32.86	2.6808	27 35 10.0	4.448	3	6 59 3.59	2.8006	27 11 23.0	5.655
4	4 48 13.92	2.6878	27 39 31.3	4.261	4	7 1 51.54	2.7977	27 5 37.3	5.867
5	4 50 55.40	2.6947	27 43 41.3	4.071	5	7 4 39.31	2.7947	26 59 38.9	6.078
6	4 53 37.29	2.7015	27 47 39.8	3.879	6	7 7 26.90	2.7915	26 53 27.9	6.288
7	4 56 19.58	2.7082	27 51 26.8	3.687	7	7 10 14.29	2.7880	26 47 4.3	6.498
8	4 59 2.27	2.7147	27 55 2.2	3.492	8	7 13 1.46	2.7843	26 40 28.1	6.707
9	5 1 45.34	2.7210	27 58 25.8	3.295	9	7 15 48.41	2.7805	26 33 39.4	6.915
10	5 4 28.79	2.7272	28 1 37.6	3.098	10	7 18 35.12	2.7765	26 26 38.3	7.121
11	5 7 12.60	2.7331	28 4 37.6	2.900	11	7 21 21.59	2.7723	26 19 24.9	7.326
12	5 9 56.76	2.7388	28 7 25.6	2.699	12	7 24 7.80	2.7679	26 11 59.2	7.529
13	5 12 41.26	2.7445	28 10 1.5	2.497	13	7 26 53.74	2.7634	26 4 21.4	7.732
14	5 15 26.10	2.7500	28 12 25.3	2.295	14	7 29 39.41	2.7587	25 56 31.4	7.933
15	5 18 11.26	2.7553	28 14 36.9	2.091	15	7 32 24.79	2.7539	25 48 29.4	8.132
16	5 20 56.73	2.7603	28 16 36.2	1.885	16	7 35 9.88	2.7489	25 40 15.5	8.330
17	5 23 42.49	2.7651	28 18 23.1	1.678	17	7 37 54.66	2.7437	25 31 49.8	8.527
18	5 26 28.54	2.7697	28 19 57.6	1.471	18	7 40 39.12	2.7383	25 23 12.3	8.722
19	5 29 14.86	2.7742	28 21 19.6	1.263	19	7 43 23.26	2.7329	25 14 23.2	8.915
20	5 32 1.44	2.7785	28 22 29.1	1.053	20	7 46 7.07	2.7272	25 5 22.5	9.107
21	5 34 48.28	2.7827	28 23 26.0	0.842	21	7 48 50.53	2.7214	24 56 10.4	9.296
22	5 37 35.36	2.7865	28 24 10.2	0.630	22	7 51 33.64	2.7156	24 46 47.0	9.484
23	5 40 22.66	2.7900	N.28 24 41.6	0.417	23	7 54 16.40	2.7096	N.24 37 12.3	9.671
	FRIDAY 26.					SUNDAY 28.			
0	5 43 10.16	2.7933	N.28 25 0.3	+0.204	0	7 56 58.79	2.7034	N.24 27 26.5	9.856
1	5 45 57.86	2.7966	28 25 6.1	−0.010	1	7 59 40.81	2.6972	24 17 29.6	10.038
2	5 48 45.75	2.7997	28 24 59.1	0.224	2	8 2 22.45	2.6908	24 7 21.9	10.218
3	5 51 33.82	2.8025	28 24 39.2	0.439	3	8 5 3.70	2.6843	23 57 3.4	10.397
4	5 54 22.05	2.8050	28 24 6.4	0.655	4	8 7 44.56	2.6777	23 46 34.2	10.574
5	5 57 10.42	2.8072	28 23 20.6	0.873	5	8 10 25.02	2.6709	23 35 54.5	10.748
6	5 59 58.92	2.8093	28 22 21.7	1.091	6	8 13 5.07	2.6641	23 25 4.4	10.921
7	6 2 47.54	2.8112	28 21 9.7	1.308	7	8 15 44.71	2.6572	23 14 4.0	11.092
8	6 5 36.26	2.8128	28 19 44.7	1.526	8	8 18 23.94	2.6503	23 2 53.4	11.261
9	6 8 25.07	2.8142	28 18 6.6	1.743	9	8 21 2.75	2.6432	22 51 32.7	11.428
10	6 11 13.96	2.8153	28 16 15.5	1.962	10	8 23 41.13	2.6361	22 40 2.1	11.592
11	6 14 2.91	2.8162	28 14 11.2	2.181	11	8 26 19.08	2.6289	22 28 21.7	11.753
12	6 16 51.91	2.8170	28 11 53.8	2.399	12	8 28 56.60	2.6217	22 16 31.7	11.913
13	6 19 40.95	2.8175	28 9 23.3	2.618	13	8 31 33.68	2.6143	22 4 32.1	12.071
14	6 22 30.01	2.8177	28 6 39.6	2.837	14	8 34 10.32	2.6070	21 52 23.2	12.226
15	6 25 19.08	2.8177	28 3 42.8	3.056	15	8 36 46.52	2.5996	21 40 5.0	12.379
16	6 28 8.14	2.8175	28 0 32.9	3.274	16	8 39 22.27	2.5921	21 27 37.7	12.530
17	6 30 57.18	2.8171	27 57 9.9	3.492	17	8 41 57.57	2.5845	21 15 1.4	12.679
18	6 33 46.19	2.8165	27 53 33.8	3.711	18	8 44 32.41	2.5769	21 2 16.2	12.826
19	6 36 35.16	2.8156	27 49 44.6	3.929	19	8 47 6.80	2.5694	20 49 22.3	12.969
20	6 39 24.07	2.8145	27 45 42.3	4.147	20	8 49 40.74	2.5618	20 36 19.9	13.110
21	6 42 12.90	2.8131	27 41 27.0	4.363	21	8 52 14.22	2.5542	20 23 9.1	13.249
22	6 45 1.64	2.8115	27 36 58.7	4.580	22	8 54 47.24	2.5465	20 9 50.0	13.386
23	6 47 50.28	2.8097	27 32 17.4	4.797	23	8 57 19.80	2.5388	19 56 22.8	13.521
24	6 50 38.81	2.8077	N.27 27 23.1	5.012	24	8 59 51.90	2.5312	N.19 42 47.5	13.653

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 59 51.90	2.5312	N.19 42 47.5	13.653
1	9 2 23.54	2.5234	19 29 4.4	13.782
2	9 4 54.71	2.5157	19 15 13.6	13.909
3	9 7 25.42	2.5080	19 1 15.3	14.034
4	9 9 55.67	2.5003	18 47 9.5	14.157
5	9 12 25.46	2.4926	18 32 56.5	14.276
6	9 14 54.78	2.4848	18 18 36.4	14.393
7	9 17 23.64	2.4772	18 4 9.3	14.508
8	9 19 52.04	2.4696	17 49 35.4	14.621
9	9 22 19.99	2.4620	17 34 54.8	14.732
10	9 24 47.48	2.4543	17 20 7.6	14.839
11	9 27 14.51	2.4467	17 5 14.1	14.943
12	9 29 41.08	2.4391	16 50 14.4	15.046
13	9 32 7.20	2.4316	16 35 8.6	15.147
14	9 34 32.87	2.4242	16 19 56.8	15.245
15	9 36 58.10	2.4167	16 4 39.2	15.340
16	9 39 22.88	2.4092	15 49 16.0	15.433
17	9 41 47.21	2.4018	15 33 47.2	15.525
18	9 44 11.10	2.3945	15 18 13.0	15.613
19	9 46 34.55	2.3873	15 2 33.6	15.698
20	9 48 57.57	2.3801	14 46 49.2	15.782
21	9 51 20.16	2.3729	14 30 59.8	15.863
22	9 53 42.32	2.3658	14 15 5.7	15.941
23	9 56 4.05	2.3587	N.13 59 6.9	16.018

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 58 25.36	2.3517	N.13 43 3.5	16.092
1	10 0 46.25	2.3447	13 26 55.8	16.163
2	10 3 6.73	2.3379	13 10 43.9	16.232
3	10 5 26.80	2.3311	12 54 27.9	16.299
4	10 7 46.46	2.3243	12 38 8.0	16.363
5	10 10 5.72	2.3177	12 21 44.3	16.426
6	10 12 24.58	2.3111	12 5 16.9	16.486
7	10 14 43.05	2.3046	11 48 46.0	16.543
8	10 17 1.13	2.2982	11 32 11.7	16.599
9	10 19 18.83	2.2917	11 15 34.1	16.652
10	10 21 36.14	2.2853	10 58 53.4	16.703
11	10 23 53.07	2.2791	10 42 9.7	16.752
12	10 26 9.63	2.2730	10 25 23.1	16.799
13	10 28 25.83	2.2670	10 8 33.8	16.843
14	10 30 41.67	2.2610	9 51 41.9	16.885
15	10 32 57.15	2.2550	9 34 47.6	16.925
16	10 35 12.27	2.2492	9 17 50.9	16.963
17	10 37 27.05	2.2435	9 0 52.0	16.999
18	10 39 41.49	2.2378	8 43 51.0	17.032
19	10 41 55.59	2.2322	8 26 48.1	17.064
20	10 44 9.36	2.2268	8 9 43.3	17.094
21	10 46 22.81	2.2214	7 52 36.8	17.122
22	10 48 35.93	2.2160	7 35 28.7	17.147
23	10 50 48.73	2.2107	7 18 19.2	17.169
24	10 53 1.22	2.2056	N. 7 1 8.4	17.190

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 53 1.22	2.2056	N. 7 1 8.4	17.190
1	10 55 13.40	2.2006	6 43 56.4	17.210
2	10 57 25.29	2.1957	6 26 43.2	17.228
3	10 59 36.89	2.1909	6 9 29.0	17.244
4	11 1 48.20	2.1861	5 52 13.9	17.257
5	11 3 59.22	2.1813	5 34 58.1	17.268
6	11 6 9.96	2.1767	5 17 41.7	17.278
7	11 8 20.43	2.1722	5 0 24.8	17.286
8	11 10 30.63	2.1678	4 43 7.4	17.293
9	11 12 40.57	2.1635	4 25 49.7	17.297
10	11 14 50.25	2.1593	4 8 31.8	17.298
11	11 16 59.68	2.1552	3 51 13.9	17.298
12	11 19 8.87	2.1512	3 33 56.0	17.297
13	11 21 17.82	2.1472	3 16 38.2	17.295
14	11 23 26.53	2.1433	2 59 20.6	17.290
15	11 25 35.01	2.1395	2 42 3.4	17.283
16	11 27 43.27	2.1359	2 24 46.6	17.275
17	11 29 51.32	2.1324	2 7 30.4	17.264
18	11 31 59.16	2.1289	1 50 14.9	17.252
19	11 34 6.79	2.1255	1 33 0.1	17.239
20	11 36 14.22	2.1222	1 15 46.2	17.224
21	11 38 21.45	2.1189	0 58 33.2	17.208
22	11 40 28.49	2.1158	0 41 21.2	17.190
23	11 42 35.35	2.1129	N. 0 24 10.4	17.170

THURSDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 44 42.04	2.1100	N. 0 7 0.8	17.149

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, . .	6	2	17.2
● New Moon, . .	14	1	28.0
☽ First Quarter, . .	22	3	53.1
○ Full Moon, . . .	28	20	38.9

	d	h
☾ Apogee, ...	14	14.9
☾ Perigee, ...	28	14.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran	W.	56° 19′ 44″	2098	58° 10′ 46″	2101	60° 1′ 44″	2105	61° 52′ 36″	2110
	Spica	E.	78 27 48	1994	76 34 5	2001	74 40 32	2009	72 47 11	2017
	Mars	E.	107 32 49	2205	105 44 29	2212	103 56 19	2220	102 8 21	2228
2	Aldebaran	W.	71 4 33	2149	72 54 18	2159	74 43 48	2170	76 33 1	2181
	Pollux	W.	27 37 21	2088	29 28 38	2098	31 19 41	2108	33 10 28	2120
	Spica	E.	63 24 0	2068	61 32 11	2080	59 40 41	2092	57 49 30	2105
	Mars	E.	93 11 58	2281	91 25 30	2293	89 39 20	2306	87 53 29	2320
	Antares	E.	109 17 39	2067	107 25 49	2079	105 34 17	2091	103 43 4	2104
3	Aldebaran	W.	85 34 23	2249	87 21 37	2265	89 8 28	2281	90 54 56	2296
	Pollux	W.	42 19 43	2185	44 8 33	2200	45 57 0	2215	47 45 5	2231
	Spica	E.	48 38 47	2177	46 49 45	2192	45 1 6	2208	43 12 50	2225
	Mars	E.	79 9 29	2396	77 25 48	2412	75 42 30	2429	73 59 36	2445
	Antares	E.	94 32 10	2175	92 43 5	2191	90 54 24	2206	89 6 6	2223
	Venus	E.	99 38 32	2592	97 59 26	2608	96 20 42	2626	94 42 22	2643
	Jupiter	E.	105 58 6	2262	104 11 11	2277	102 24 38	2293	100 38 28	2309
	Sun	E.	129 44 13	2513	128 3 18	2528	126 22 44	2545	124 42 33	2561
4	Pollux	W.	56 39 35	2312	58 25 17	2329	60 10 34	2346	61 55 27	2363
	Regulus	W.	19 45 16	2309	21 31 3	2325	23 16 26	2342	25 1 24	2359
	Spica	E.	34 17 40	2309	32 31 53	2326	30 46 31	2344	29 1 35	2361
	Mars	E.	65 31 16	2535	63 50 52	2554	62 10 54	2573	60 31 22	2592
	Antares	E.	80 10 38	2305	78 24 46	2322	76 39 19	2340	74 54 18	2357
	Venus	E.	86 36 38	2734	85 0 43	2752	83 25 12	2771	81 50 6	2790
	Jupiter	E.	91 53 35	2393	90 9 50	2410	88 26 29	2427	86 43 33	2445
	Sun	E.	116 27 21	2647	114 49 30	2665	113 12 3	2683	111 35 0	2701
5	Pollux	W.	70 33 43	2448	72 16 9	2465	73 58 11	2482	75 39 49	2499
	Regulus	W.	33 40 9	2444	35 22 41	2461	37 4 49	2478	38 46 33	2495
	Mars	E.	52 20 12	2688	50 43 16	2707	49 6 46	2727	47 30 42	2747
	Antares	E.	66 15 22	2443	64 32 48	2460	62 50 39	2477	61 8 54	2494
	Venus	E.	74 0 51	2886	72 28 14	2905	70 56 2	2924	69 24 14	2944
	Jupiter	E.	78 15 6	2533	76 34 39	2551	74 54 36	2568	73 14 57	2586
	Sun	E.	103 35 52	2793	102 1 15	2811	100 27 2	2829	98 53 12	2848
6	Pollux	W.	84 2 12	2582	85 41 32	2597	87 20 31	2613	88 59 8	2628
	Regulus	W.	47 9 23	2577	48 48 49	2593	50 27 54	2609	52 6 37	2624
	Mars	E.	39 36 56	2847	38 3 29	2867	36 30 28	2888	34 57 54	2909
	Antares	E.	52 46 0	2577	51 6 33	2593	49 27 28	2608	47 48 44	2624
	Venus	E.	61 51 15	3038	60 21 49	3056	58 52 46	3075	57 24 6	3093
	Jupiter	E.	65 2 43	2672	63 25 26	2689	61 48 32	2706	60 12 0	2722
	Sun	E.	91 9 50	2936	89 38 17	2953	88 7 5	2970	86 36 15	2967
7	Pollux	W.	97 7 7	2702	98 43 44	2716	100 20 2	2730	101 56 2	2744
	Regulus	W.	60 15 4	2698	61 51 47	2712	63 28 11	2725	65 4 17	2739
	Mars	E.	27 21 58	3025	25 52 16	3051	24 23 6	3079	22 54 31	3110
	Antares	E.	39 40 15	2698	38 3 32	2712	36 27 8	2725	34 51 2	2739
	Venus	E.	50 6 12	3182	48 39 41	3198	47 13 30	3216	45 47 40	3233
	Jupiter	E.	52 14 45	2803	50 40 21	2819	49 6 18	2835	47 32 85	2849
	Sun	E.	79 7 12	3067	77 38 22	3082	76 9 51	3096	74 41 39	3112
8	Regulus	W.	73 0 29	2801	74 34 55	2813	76 9 6	2824	77 43 3	2835

GREENWICH MEAN TIME.

LUNAR DISTANCES

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Aldebaran	W.	63° 43′ 20″	2116	65° 33′ 55″	2122	67° 24′ 20″	2130	69° 14′ 33″	2139
	Spica	E.	70 54 3	2026	69 1 9	2035	67 8 30	2046	65 16 7	2056
	Mars	E.	100 20 35	2237	98 33 3	2247	96 45 45	2258	94 58 43	2269
2	Aldebaran	W.	78 21 57	2194	80 10 34	2207	81 58 51	2220	83 46 48	2235
	Pollux	W.	35 0 57	2132	36 51 8	2144	38 41 0	2157	40 30 32	2171
	Spica	E.	55 58 39	2118	54 8 8	2133	52 17 59	2147	50 28 12	2162
	Mars	E.	86 7 59	2334	84 22 49	2348	82 38 0	2364	80 53 33	2380
	Antares	E.	101 52 11	2117	100 1 38	2132	98 11 27	2146	96 21 38	2160
3	Aldebaran	W.	92 41 1	2313	94 26 42	2330	96 11 58	2347	97 56 49	2364
	Pollux	W.	49 32 46	2247	51 20 4	2262	53 6 59	2279	54 53 29	2296
	Spica	E.	41 24 59	2241	39 37 32	2258	37 50 30	2274	36 3 52	2291
	Mars	E.	72 17 6	2463	70 35 1	2481	68 53 21	2499	67 12 6	2517
	Antares	E.	87 18 12	2239	85 30 42	2255	83 43 36	2272	81 56 55	2288
	Venus	E.	93 4 25	2660	91 26 52	2678	89 49 43	2696	88 12 58	2715
	Jupiter	E.	98 52 41	2325	97 7 18	2342	95 22 19	2359	93 37 45	2375
	SUN	E.	123 2 44	2577	121 23 18	2594	119 44 15	2612	118 5 36	2629
4	Pollux	W.	63 39 55	2380	65 23 59	2397	67 7 38	2414	68 50 53	2431
	Regulus	W.	26 45 58	2376	28 30 7	2393	30 13 52	2410	31 57 13	2427
	Spica	E.	27 17 4	2379	25 32 59	2397	23 49 20	2415	22 6 7	2433
	Mars	E.	58 52 16	2611	57 13 36	2630	55 35 22	2649	53 57 34	2669
	Antares	E.	73 9 41	2374	71 25 29	2391	69 41 42	2409	67 58 20	2426
	Venus	E.	80 15 25	2809	78 41 9	2828	77 7 18	2848	75 33 52	2867
	Jupiter	E.	85 1 2	2462	83 18 56	2480	81 37 14	2498	79 55 58	2515
	SUN	E.	109 58 22	2719	108 22 8	2738	106 46 18	2756	105 10 53	2775
5	Pollux	W.	77 21 4	2515	79 1 56	2533	80 42 24	2549	82 22 29	2565
	Regulus	W.	40 27 53	2512	42 8 50	2528	43 49 24	2545	45 29 35	2561
	Mars	E.	45 55 5	2766	44 19 53	2787	42 45 8	2807	41 10 49	2827
	Antares	E.	59 27 33	2511	57 46 35	2528	56 6 1	2544	54 25 49	2561
	Venus	E.	67 52 51	2963	66 21 52	2981	64 51 16	3001	63 21 4	3019
	Jupiter	E.	71 35 43	2604	69 56 53	2621	68 18 26	2638	66 40 23	2655
	SUN	E.	97 19 46	2866	95 46 43	2883	94 14 3	2901	92 41 45	2919
6	Pollux	W.	90 37 25	2643	92 15 21	2659	93 52 56	2674	95 30 11	2688
	Regulus	W.	53 44 59	2640	55 23 0	2655	57 0 41	2669	58 38 2	2684
	Mars	E.	33 25 47	2931	31 54 7	2953	30 22 55	2976	28 52 12	2999
	Antares	E.	46 10 22	2639	44 32 20	2655	42 54 39	2669	41 17 17	2684
	Venus	E.	55 55 48	3111	54 27 52	3129	53 0 17	3147	51 33 4	3164
	Jupiter	E.	58 35 50	2739	57 0 2	2755	55 24 35	2771	53 49 29	2788
	SUN	E.	85 5 46	3003	83 35 37	3020	82 5 49	3036	80 36 21	3052
7	Pollux	W.	103 31 44	2756	105 7 9	2769	106 42 17	2782	108 17 8	2795
	Regulus	W.	66 40 5	2752	68 15 36	2765	69 50 50	2778	71 25 47	2789
	Mars	E.	21 26 33	3144	19 59 17	3183	18 32 48	3228	17 7 12	3281
	Antares	E.	33 15 14	2752	31 39 43	2766	30 4 30	2778	28 29 33	2790
	Venus	E.	44 22 10	3250	42 57 0	3266	41 32 9	3283	40 7 38	3300
	Jupiter	E.	45 59 11	2865	44 26 7	2880	42 53 23	2895	41 20 58	2911
	SUN	E.	73 13 44	3127	71 46 7	3140	70 18 46	3154	68 51 42	3168
8	Regulus	W.	79 16 45	2846	80 50 13	2856	82 23 28	2866	83 56 30	2876

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Spica	W.	19° 1′ 48″	2809	20° 36′ 4″	2820	22° 10′ 6″	2831	23° 43′ 54″	2841
	Antares	E.	26 54 52	2802	25 20 27	2814	23 46 17	2825	22 12 22	2836
	Venus	E.	38 43 27	3318	37 19 36	3334	35 56 4	3351	34 32 52	3368
	Jupiter	E.	39 48 53	2926	38 17 7	2942	36 45 41	2957	35 14 34	2973
	Sun	E.	67 24 54	3181	65 58 22	3193	64 32 5	3206	63 6 3	3219
9	Regulus	W.	85 29 19	2886	87 1 56	2895	88 34 21	2904	90 6 35	2912
	Spica	W.	31 29 42	2889	33 2 15	2898	34 34 37	2907	36 6 47	2915
	Venus	E.	27 41 57	3463	26 20 52	3486	25 0 12	3509	23 39 58	3535
	Sun	E.	55 59 23	3275	54 34 42	3286	53 10 14	3295	51 45 57	3306
10	Regulus	W.	97 45 7	2951	99 16 21	2958	100 47 26	2965	102 18 23	2972
	Spica	W.	43 45 6	2954	45 16 17	2960	46 47 20	2967	48 18 14	2973
	Sun	E.	44 47 21	3351	43 24 9	3360	42 1 7	3369	40 38 15	3377
11	Spica	W.	55 50 53	3001	57 21 4	3006	58 51 9	3011	60 21 8	3016
	Mars	W.	20 49 14	3395	22 11 36	3383	23 34 12	3374	24 56 58	3366
	Sun	E.	33 46 12	3416	32 24 14	3425	31 2 26	3433	29 40 47	3441
16	Sun	W.	21 2 11	3523	22 22 10	3514	23 42 19	3506	25 2 37	3497
	α Arietis	E.	79 0 52	3088	77 32 28	3086	76 4 1	3084	74 35 32	3082
	Aldebaran	E.	110 16 14	3150	108 49 5	3146	107 21 51	3143	105 54 33	3139
17	Sun	W.	31 46 9	3464	33 7 13	3458	34 28 24	3451	35 49 43	3445
	α Arietis	E.	67 12 27	3070	65 43 41	3067	64 14 51	3064	62 45 57	3060
	Aldebaran	E.	98 36 59	3121	97 9 15	3116	95 41 25	3112	94 13 30	3108
18	Sun	W.	42 38 5	3412	44 0 8	3404	45 22 20	3396	46 44 41	3389
	α Arietis	E.	55 20 20	3041	53 50 58	3036	52 21 30	3031	50 51 56	3026
	Aldebaran	E.	86 52 33	3083	85 24 3	3078	83 55 27	3073	82 26 44	3068
19	Sun	W.	53 38 42	3345	55 2 1	3336	56 25 31	3326	57 49 12	3316
	α Arietis	E.	43 22 34	3001	41 52 22	2995	40 22 3	2990	38 51 38	2985
	Aldebaran	E.	75 1 15	3034	73 31 45	3028	72 2 7	3021	70 32 20	3014
20	Sun	W.	64 50 44	3259	66 15 43	3247	67 40 56	3235	69 6 24	3222
	Fomalhaut	W.	40 2 41	3593	41 21 23	3539	42 41 4	3489	44 1 40	3443
	Saturn	W.	29 39 28	2919	31 11 23	2907	32 43 33	2896	34 15 57	2883
	Aldebaran	E.	63 1 4	2974	61 30 19	2966	59 59 24	2958	58 28 19	2950
	Pollux	E.	105 42 8	2882	104 9 26	2872	102 36 31	2860	101 3 21	2848
21	Sun	W.	76 17 44	3152	77 44 51	3136	79 12 17	3121	80 40 1	3105
	Fomalhaut	W.	50 56 49	3248	52 22 1	3214	53 47 53	3183	55 14 22	3152
	Saturn	W.	42 1 59	2818	43 36 3	2805	45 10 24	2791	46 45 4	2776
	Aldebaran	E.	50 50 18	2909	49 18 11	2903	47 45 56	2896	46 13 32	2889
	Pollux	E.	93 13 34	2785	91 38 46	2771	90 3 40	2757	88 28 16	2743
22	Sun	W.	88 3 40	3021	89 33 27	3004	91 3 35	2985	92 34 6	2968
	Fomalhaut	W.	62 35 45	3012	64 5 43	2987	65 36 12	2962	67 7 13	2938
	Saturn	W.	54 43 20	2698	56 20 2	2682	57 57 6	2666	59 34 31	2649
	α Pegasi	W.	40 59 32	3214	42 25 25	3164	43 52 17	3118	45 20 5	3074
	Aldebaran	E.	38 29 43	2869	36 56 45	2870	35 23 48	2872	33 50 53	2877
	Pollux	E.	80 26 19	2666	78 48 53	2650	77 11 6	2634	75 32 57	2617

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
8	Spica	W.	25 17 29	2851	26 50 51	2861	28 24 0	2870	29 56 57	2880
	Antares	E.	20 38 41	2847	19 5 14	2859	17 32 2	2869	15 59 3	2878
	Venus	E.	33 9 59	3386	31 47 27	3404	30 25 15	3423	29 3 25	3443
	Jupiter	E.	33 43 47	2989	32 13 20	3005	30 43 14	3022	29 13 29	3040
	Sun	E.	61 40 16	3231	60 14 43	3242	58 49 23	3253	57 24 16	3265
9	Regulus	W.	91 38 38	2921	93 10 30	2929	94 42 12	2937	96 13 44	2944
	Spica	W.	37 38 47	2923	39 10 37	2931	40 42 16	2938	42 13 46	2946
	Venus	E.	22 20 13	3564	21 0 59	3596	19 42 20	3634	18 24 22	3676
	Sun	E.	50 21 52	3315	48 57 58	3325	47 34 15	3334	46 10 43	3343
10	Regulus	W.	103 49 11	2978	105 19 51	2984	106 50 24	2989	108 20 50	2995
	Spica	W.	49 49 1	2979	51 19 40	2985	52 50 11	2991	54 20 35	2996
	Sun	E.	39 15 32	3385	37 52 58	3393	36 30 34	3401	35 8 19	3408
11	Spica	W.	61 51 1	3020	63 20 49	3025	64 50 31	3029	66 20 8	3032
	Mars	W.	26 19 53	3361	27 42 54	3357	29 6 0	3354	30 29 9	3351
	Sun	E.	28 19 17	3450	26 57 57	3458	25 36 46	3468	24 15 46	3478
16	Sun	W.	26 23 4	3490	27 43 39	3483	29 4 22	3477	30 25 12	3471
	α Arietis	E.	73 7 0	3080	71 38 26	3078	70 9 49	3076	68 41 10	3073
	Aldebaran	E.	104 27 11	3136	102 59 45	3132	101 32 14	3129	100 4 39	3124
17	Sun	W.	37 11 9	3438	38 32 42	3432	39 54 22	3425	41 16 10	3419
	α Arietis	E.	61 16 59	3056	59 47 56	3053	58 18 49	3049	56 49 37	3045
	Aldebaran	E.	92 45 30	3103	91 17 24	3099	89 49 13	3094	88 20 56	3089
18	Sun	W.	48 7 10	3381	49 29 48	3372	50 52 36	3364	52 15 34	3355
	α Arietis	E.	49 22 16	3022	47 52 30	3017	46 22 38	3011	44 52 39	3006
	Aldebaran	E.	80 57 53	3060	79 28 55	3055	77 59 50	3048	76 30 37	3041
19	Sun	W.	59 13 5	3306	60 37 10	3294	62 1 28	3283	63 25 59	3271
	α Arietis	E.	37 21 6	2980	35 50 28	2975	34 19 44	2969	32 48 53	2965
	Aldebaran	E.	69 2 24	3006	67 32 19	2998	66 2 4	2990	64 31 39	2982
20	Sun	W.	70 32 7	3209	71 58 6	3194	73 24 22	3181	74 50 54	3166
	Fomalhaut	W.	45 23 8	3400	46 45 25	3358	48 8 29	3319	49 32 18	3283
	Saturn	W.	35 48 37	2871	37 21 33	2859	38 54 45	2846	40 28 13	2832
	Aldebaran	E.	56 57 3	2942	55 25 37	2934	53 54 1	2926	52 22 15	2917
	Pollux	E.	99 29 56	2836	97 56 15	2824	96 22 18	2811	94 48 5	2798
21	Sun	W.	82 8 5	3089	83 36 28	3073	85 5 11	3056	86 34 15	3039
	Fomalhaut	W.	56 41 29	3122	58 9 12	3094	59 37 29	3066	61 6 20	3039
	Saturn	W.	48 20 3	2762	49 55 22	2746	51 31 1	2731	53 7 0	2715
	Aldebaran	E.	44 40 59	2883	43 8 19	2878	41 35 32	2873	40 2 39	2871
	Pollux	E.	86 52 32	2728	85 16 29	2713	83 40 6	2698	82 3 23	2682
22	Sun	W.	94 4 59	2950	95 36 15	2931	97 7 55	2912	98 39 59	2893
	Fomalhaut	W.	68 38 44	2913	70 10 46	2889	71 43 19	2866	73 16 21	2843
	Saturn	W.	61 12 19	2632	62 50 30	2615	64 29 5	2597	66 8 4	2580
	α Pegasi	W.	46 48 46	3033	48 18 18	2994	49 48 38	2957	51 19 45	2921
	Aldebaran	E.	32 18 5	2886	30 45 28	2898	29 13 7	2916	27 41 8	2941
	Pollux	E.	73 54 25	2600	72 15 30	2583	70 36 12	2566	68 56 31	2548

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Sun	W.	100° 12′ 27″	2874	101° 45′ 19″	2855	103° 18′ 36″	2835	104° 52′ 18″	2815
	Fomalhaut	W.	74 49 53	2821	76 23 54	2799	77 58 23	2777	79 33 21	2756
	Saturn	W.	67 47 27	2562	69 27 14	2544	71 7 26	2526	72 48 3	2508
	α Pegasi	W.	52 51 37	2867	54 24 12	2855	55 57 29	2823	57 31 27	2792
	Pollux	E.	67 16 25	2531	65 35 55	2514	63 55 1	2496	62 13 42	2478
	Regulus	E.	104 7 59	2526	102 27 22	2508	100 46 20	2490	99 4 53	2472
24	Sun	W.	112 47 13	2717	114 23 30	2698	116 0 13	2678	117 37 22	2659
	Fomalhaut	W.	87 34 57	2657	89 12 35	2638	90 50 38	2621	92 29 5	2603
	Saturn	W.	81 17 32	2416	83 0 44	2398	84 44 22	2379	86 28 27	2361
	α Pegasi	W.	65 30 52	2655	67 8 33	2629	68 46 48	2604	70 25 37	2581
	α Arietis	W.	21 58 51	2527	23 39 26	2491	25 20 52	2458	27 3 5	2426
	Pollux	E.	53 40 48	2388	51 56 56	2371	50 12 39	2353	48 27 56	2335
	Regulus	E.	90 31 12	2381	88 47 10	2362	87 2 41	2344	85 17 46	2326
25	Saturn	W.	95 15 23	2272	97 2 4	2255	98 49 10	2237	100 36 42	2221
	α Pegasi	W.	78 47 32	2472	80 29 24	2453	82 11 44	2433	83 54 31	2416
	α Arietis	W.	35 44 19	2296	37 30 21	2277	39 16 55	2256	41 4 0	2235
	Pollux	E.	39 37 58	2249	37 50 44	2233	36 3 6	2218	34 15 5	2203
	Regulus	E.	76 26 38	2237	74 39 6	2220	72 51 9	2204	71 2 47	2187
26	α Arietis	W.	50 6 36	2145	51 56 26	2130	53 46 40	2114	55 37 18	2099
	Aldebaran	W.	20 59 34	2731	22 35 33	2626	24 13 52	2542	25 54 7	2472
	Regulus	E.	61 54 52	2110	60 4 8	2096	58 13 2	2083	56 21 36	2069
27	α Arietis	W.	64 55 38	2038	66 48 13	2028	68 41 4	2019	70 34 9	2010
	Aldebaran	W.	34 35 55	2245	36 23 15	2216	38 11 19	2190	40 0 1	2167
	Regulus	E.	46 59 38	2013	45 6 24	2003	43 12 55	1995	41 19 13	1987
	Spica	E.	101 0 4	2014	99 6 51	2005	97 13 24	1996	95 19 43	1987
28	α Arietis	W.	80 2 27	1981	81 56 32	1977	83 50 43	1974	85 44 58	1973
	Aldebaran	W.	49 10 56	2089	51 2 12	2079	52 53 44	2070	54 45 29	2063
	Regulus	E.	31 48 2	1960	29 53 24	1956	27 58 41	1955	26 3 55	1953
	Spica	E.	85 48 34	1960	83 53 56	1956	81 59 13	1954	80 4 26	1952
29	α Arietis	W.	95 16 25	1977	97 10 36	1981	99 4 41	1985	100 58 39	1990
	Aldebaran	W.	64 6 15	2048	65 58 34	2049	67 50 52	2050	69 43 8	2053
	Pollux	W.	20 34 35	1991	22 28 23	1991	24 22 12	1989	26 16 3	1991
	Spica	E.	70 30 20	1957	68 35 38	1960	66 41 1	1965	64 46 31	1969
	Antares	E.	116 23 59	1956	114 29 15	1959	112 34 36	1963	110 40 4	1968
30	Aldebaran	W.	79 2 48	2083	80 54 14	2092	82 45 26	2101	84 36 24	2112
	Pollux	W.	35 43 57	2018	37 37 3	2026	39 29 56	2035	41 22 35	2046
	Spica	E.	55 16 23	2007	53 22 59	2016	51 29 49	2026	49 36 55	2037
	Antares	E.	101 9 45	2005	99 16 18	2014	97 23 6	2025	95 30 10	2035
	Mars	E.	103 23 27	2218	101 35 27	2228	99 47 41	2239	98 0 11	2249
31	Aldebaran	W.	93 46 48	2176	95 35 52	2190	97 24 34	2206	99 12 52	2223
	Pollux	W.	50 41 32	2107	52 32 21	2121	54 22 48	2136	56 12 53	2151
	Spica	E.	40 17 6	2102	38 26 10	2117	36 35 37	2132	34 45 27	2149
	Antares	E.	86 10 2	2099	84 19 2	2114	82 28 24	2129	80 38 9	2144
	Mars	E.	89 7 9	2316	87 21 33	2332	85 36 20	2347	83 51 29	2364
	Jupiter	E.	103 21 31	2176	101 32 27	2190	99 43 44	2205	97 55 24	2220

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XV^h.	P. L of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
23	Sun	W.	106° 26′ 26″	2796	108° 0′ 59″	2776	109° 35′ 58″	2757	111° 11′ 22″	2737
	Fomalhaut	W.	81 8 46	2736	82 44 38	2715	84 20 58	2695	85 57 44	2675
	Saturn	W.	74 29 5	2489	76 10 33	2471	77 52 27	2453	79 34 46	2434
	α Pegasi	W.	59 6 5	2763	60 41 21	2735	62 17 15	2707	63 53 46	2681
	Pollux	E.	60 31 58	2460	58 49 49	2442	57 7 14	2424	55 24 14	2406
	Regulus	E.	97 23 0	2454	95 40 42	2436	93 57 58	2417	92 14 48	2399
24	Sun	W.	119 14 57	2640	120 52 58	2621	122 31 25	2601	124 10 18	2583
	Fomalhaut	W.	94 7 56	2586	95 47 10	2570	97 26 46	2554	99 6 44	2540
	Saturn	W.	88 12 58	2343	89 57 55	2325	91 43 18	2307	93 29 8	2289
	α Pegasi	W.	72 4 58	2558	73 44 51	2535	75 25 15	2514	77 6 9	2493
	α Arietis	W.	28 46 2	2398	30 29 40	2371	32 13 57	2345	33 58 51	2322
	Pollux	E.	46 42 47	2317	44 57 13	2300	43 11 13	2283	41 24 48	2266
	Regulus	E.	83 32 25	2309	81 46 38	2290	80 0 24	2272	78 13 44	2255
25	Saturn	W.	102 24 38	2204	104 12 59	2189	106 1 43	2173	107 50 51	2158
	α Pegasi	W.	85 37 43	2398	87 21 20	2382	89 5 21	2366	90 49 44	2351
	α Arietis	W.	42 51 36	2216	44 39 40	2197	46 28 12	2179	48 17 11	2162
	Pollux	E.	32 26 42	2188	30 37 57	2174	28 48 50	2161	26 59 24	2149
	Regulus	E.	69 14 0	2171	67 24 49	2155	65 35 13	2139	63 45 14	2124
26	α Arietis	W.	57 28 18	2086	59 19 39	2073	61 11 20	2061	63 3 20	2049
	Aldebaran	W.	27 36 0	2412	29 19 18	2361	31 3 49	2317	32 49 24	2279
	Regulus	E.	54 29 49	2057	52 37 43	2045	50 45 19	2033	48 52 37	2023
27	α Arietis	W.	72 27 27	2003	74 20 57	1996	76 14 38	1990	78 8 28	1984
	Aldebaran	W.	41 49 18	2147	43 39 5	2130	45 29 19	2114	47 19 57	2100
	Regulus	E.	39 25 19	1981	37 31 14	1974	35 36 58	1968	33 42 34	1963
	Spica	E.	93 25 49	1981	91 31 44	1974	89 37 29	1968	87 43 5	1964
28	α Arietis	W.	87 39 15	1972	89 33 34	1972	91 27 53	1973	93 22 10	1974
	Aldebaran	W.	56 37 25	2057	58 29 30	2053	60 21 41	2050	62 13 57	2049
	Regulus	E.	24 9 6	1952	22 14 16	1953	20 19 27	1954	18 24 40	1956
	Spica	E.	78 9 36	1951	76 14 45	1952	74 19 55	1953	72 25 6	1955
29	α Arietis	W.	102 52 29	1996	104 46 9	2003	106 39 38	2011	108 32 55	2019
	Aldebaran	W.	71 35 19	2057	73 27 24	2062	75 19 22	2068	77 11 10	2075
	Pollux	W.	28 9 51	1994	30 3 34	1998	31 57 11	2004	33 50 39	2010
	Spica	E.	62 52 8	1975	60 57 55	1982	59 3 52	1989	57 10 1	1998
	Antares	E.	108 45 40	1974	106 51 25	1981	104 57 20	1987	103 3 26	1996
30	Aldebaran	W.	86 27 5	2123	88 17 29	2135	90 7 35	2147	91 57 22	2161
	Pollux	W.	43 14 58	2057	45 7 4	2068	46 58 53	2080	48 50 23	2094
	Spica	E.	47 44 19	2049	45 52 1	2061	44 0 2	2074	42 8 23	2088
	Antares	E.	93 37 30	2046	91 45 8	2059	89 53 6	2072	88 1 24	2085
	Mars	E.	96 12 57	2262	94 26 1	2274	92 39 24	2287	90 53 6	2302
31	Aldebaran	W.	101 0 46	2239	102 48 15	2257	104 35 18	2276	106 21 53	2294
	Pollux	W.	58 2 34	2167	59 51 52	2182	61 40 46	2199	63 29 15	2216
	Spica	E.	32 55 42	2165	31 6 21	2182	29 17 26	2199	27 28 57	2217
	Antares	E.	78 48 17	2160	76 58 49	2177	75 9 47	2194	73 21 10	2210
	Mars	E.	82 7 2	2381	80 23 0	2398	78 39 22	2415	76 56 9	2434
	Jupiter	E.	96 7 27	2237	94 19 54	2253	92 32 45	2270	90 46 1	2287

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Merid-ian.	Equation of Time, *to be added to Apparent Time.*	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	21 1 8.20	10.172	S. 16 58 41.1	+43.02	16 15.99	68.22	13 54.96	0.315
Frid.	2	21 5 11.89	10.138	16 41 19.6	43.76	16 15.83	68.10	14 2.07	0.281
Sat.	3	21 9 14.77	10.103	16 23 40.7	44.48	16 15.67	67.99	14 8.38	0.247
Sun.	4	21 13 16.84	10.069	16 5 44.7	45.18	16 15.50	67.88	14 13.88	0.213
Mon.	5	21 17 18.11	10.036	15 47 32.0	45.87	16 15.33	67.77	14 18.58	0.180
Tues.	6	21 21 18.58	10.003	15 29 3.0	46.54	16 15.15	67.65	14 22.49	0.147
Wed.	7	21 25 18.27	9.971	15 10 18.0	47.19	16 14.97	67.54	14 25.62	0.115
Thur.	8	21 29 17.18	9.938	14 51 17.6	47.83	16 14.79	67.43	14 27.96	0.082
Frid.	9	21 33 15.31	9.906	14 32 2.2	48.45	16 14.60	67.32	14 29.52	0.050
Sat.	10	21 37 12.66	9.874	14 12 32.1	49.05	16 14.41	67.21	14 30.32	0.018
Sun.	11	21 41 9.24	9.842	13 52 47.9	49.63	16 14.21	67.10	14 30.34	0.014
Mon.	12	21 45 5.05	9.810	13 32 50.0	50.19	16 14.02	66.98	14 29.59	0.046
Tues.	13	21 49 0.12	9.779	13 12 38.7	50.74	16 13.82	66.87	14 28.10	0.077
Wed.	14	21 52 54.44	9.747	12 52 14.5	51.26	16 13.64	66.76	14 25.87	0.108
Thur.	15	21 56 48.01	9.716	12 31 37.8	51.77	16 13.42	66.66	14 22.90	0.139
Frid.	16	22 0 40.84	9.686	12 10 49.3	52.26	16 13.21	66.55	14 19.19	0.169
Sat.	17	22 4 32.95	9.656	11 49 49.2	52.73	16 13.01	66.45	14 14.76	0.199
Sun.	18	22 8 24.35	9.626	11 28 38.2	53.18	16 12.80	66.35	14 9.62	0.229
Mon.	19	22 12 15.04	9.597	11 7 16.3	53.62	16 12.59	66.26	14 3.77	0.258
Tues.	20	22 16 5.06	9.569	10 45 44.2	54.04	16 12.38	66.16	13 57.24	0.286
Wed.	21	22 19 54.41	9.542	10 24 2.3	54.44	16 12.16	66.07	13 50.05	0.313
Thur.	22	22 23 43.09	9.515	10 2 11.1	54.82	16 11.94	65.98	13 42.20	0.340
Frid.	23	22 27 31.12	9.489	9 40 10.9	55.19	16 11.72	65.89	13 33.70	0.366
Sat.	24	22 31 18.53	9.464	9 18 2.0	55.54	16 11.49	65.80	13 24.59	0.391
Sun.	25	22 35 5.35	9.439	8 55 44.7	55.88	16 11.26	65.72	13 14.88	0.416
Mon.	26	22 38 51.58	9.415	8 33 19.6	56.20	16 11.03	65.63	13 4.59	0.440
Tues.	27	22 42 37.24	9.392	8 10 47.0	56.50	16 10.79	65.55	12 53.37	0.463
Wed.	28	22 46 22.36	9.370	7 48 7.5	56.79	16 10.55	65.47	12 42.32	0.485
Thur.	29	22 50 6.97	9.349	S. 7 25 21.3	+57.06	16 10.30	65.40	12 30.42	0.506

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^s.18$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 hour.	THE SUN'S Apparent Declination.	Diff. for 1 hour.	Equation of Time, *to be subtracted from Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	21 1 5.84	10.171	S. 16 58 51.1	+43.01	13 54.88	0.315	20 47 10.96
Frid.	2	21 5 9.52	10.137	16 41 29.8	43.75	14 2.00	0.281	20 51 7.52
Sat.	3	21 9 12.39	10.103	16 23 51.1	44.47	14 8.32	0.247	20 55 4.07
Sun.	4	21 13 14.46	10.069	16 5 55.4	45.17	14 13.83	0.213	20 59 0.63
Mon.	5	21 17 15.72	10.036	15 47 43.0	45.86	14 18.54	0.180	21 2 57.18
Tues.	6	21 21 16.19	10.003	15 29 14.1	46.53	14 22.45	0.147	21 6 53.74
Wed.	7	21 25 15.88	9.971	15 10 29.3	47.18	14 25.59	0.115	21 10 50.29
Thur.	8	21 29 14.79	9.938	14 51 29.2	47.82	14 27.94	0.082	21 14 46.85
Frid.	9	21 33 12.92	9.906	14 32 13.9	48.44	14 29.51	0.050	21 18 43.41
Sat.	10	21 37 10.28	9.874	14 12 43.9	49.04	14 30.31	0.018	21 22 39.97
Sun.	11	21 41 6.86	9.842	13 52 59.8	49.62	14 30.34	0.014	21 26 36.52
Mon.	12	21 45 2.68	9.810	13 33 2.0	50.18	14 29.60	0.046	21 30 33.08
Tues.	13	21 48 57.76	9.779	13 12 50.9	50.73	14 28.13	0.077	21 34 29.63
Wed.	14	21 52 52.09	9.748	12 52 26.7	51.26	14 25.90	0.108	21 38 26.19
Thur.	15	21 56 45.68	9.717	12 31 50.2	51.77	14 22.94	0.139	21 42 22.74
Frid.	16	22 0 38.53	9.687	12 11 1.7	52.26	14 19.23	0.169	21 46 19.30
Sat.	17	22 4 30.66	9.657	11 50 1.7	52.73	14 14.81	0.199	21 50 15.85
Sun.	18	22 8 22.08	9.627	11 28 50.7	53.18	14 9.67	0.229	21 54 12.41
Mon.	19	22 12 12.79	9.598	11 7 28.8	53.62	14 3.83	0.258	21 58 8.96
Tues.	20	22 16 2.83	9.570	10 45 56.7	54.04	13 57.31	0.286	22 2 5.52
Wed.	21	22 19 52.20	9.543	10 24 14.8	54.44	13 50.13	0.313	22 6 2.07
Thur.	22	22 23 40.90	9.516	10 2 23.6	54.82	13 42.28	0.340	22 9 58.62
Frid.	23	22 27 28.96	9.490	9 40 23.3	55.19	13 33.79	0.366	22 13 55.17
Sat.	24	22 31 16.41	9.465	9 18 14.3	55.54	13 24.68	0.391	22 17 51.73
Sun.	25	22 35 3.26	9.440	8 55 57.0	55.88	13 14.98	0.416	22 21 48.28
Mon.	26	22 38 49.52	9.416	8 33 31.9	56.20	13 4.68	0.440	22 25 44.84
Tues.	27	22 42 35.21	9.393	8 10 59.2	56.50	12 53.82	0.463	22 29 41.39
Wed.	28	22 46 20.37	9.371	7 48 19.6	56.79	12 42.42	0.485	22 33 37.95
Thur.	29	22 50 5.02	9.350	S. 7 25 33.2	+57.07	12 30.52	0.506	22 37 34.50

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

Diff. for 1 hour. +9ˢ.8565

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	THE SUN'S *True* LONGITUDE. λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	32	312 48 39.6	48 28.7	152.10	−0.11	9.9937300	+28.9	3 12 17.46
2	33	313 49 29.6	49 18.5	152.06	0.25	.9938006	29.8	3 8 21.55
3	34	314 50 18.7	50 7.5	152.02	0.36	.9938734	30.7	3 4 25.64
4	35	315 51 6.9	50 55.6	151.98	0.46	.9939483	31.6	3 0 29.73
5	36	316 51 54.1	51 42.6	151.94	0.55	.9940252	32.4	2 56 33.81
6	37	317 52 40.3	52 28.6	151.90	0.61	.9941040	33.1	2 52 37.91
7	38	318 53 25.7	53 13.9	151.86	0.62	.9941844	33.8	2 48 42.00
8	39	319 54 10.0	53 58.1	151.82	0.60	.9942664	34.4	2 44 46.08
9	40	320 54 53.0	54 41.0	151.77	0.57	.9943498	35.0	2 40 50.17
10	41	321 55 34.8	55 22.6	151.72	0.49	.9944344	35.5	2 36 54.26
11	42	322 56 15.4	56 3.0	151.67	0.41	.9945203	36.0	2 32 58.35
12	43	323 56 54.8	56 42.2	151.61	0.29	.9946073	36.4	2 29 2.44
13	44	324 57 32.8	57 20.2	151.55	0.16	.9946952	36.8	2 25 6.53
14	45	325 58 9.3	57 56.6	151.49	−0.03	.9947840	37.2	2 21 10.62
15	46	326 58 44.2	58 31.3	151.42	+0.11	.9948738	37.6	2 17 14.71
16	47	327 59 17.4	59 4.3	151.35	0.25	.9949647	38.0	2 13 18.80
17	48	328 59 48.7	59 35.5	151.27	0.36	.9950567	38.5	2 9 22.90
18	49	330 0 18.2	0 4.9	151.20	0.47	.9951497	39.0	2 5 26.99
19	50	331 0 45.8	0 32.4	151.12	0.53	.9952488	39.5	2 1 31.09
20	51	332 1 11.5	0 57.9	151.04	0.58	.9953393	40.0	1 57 35.18
21	52	333 1 35.3	1 21.6	150.95	0.59	.9954362	40.6	1 53 39.26
22	53	334 1 57.1	1 43.3	150.87	0.56	.9955345	41.2	1 49 43.35
23	54	335 2 17.0	2 3.1	150.79	0.52	.9956343	41.9	1 45 47.44
24	55	336 2 34.9	2 20.9	150.71	0.44	.9957358	42.6	1 41 51.54
25	56	337 2 50.8	2 36.6	150.62	0.35	.9958390	43.3	1 37 55.63
26	57	338 3 4.8	2 50.5	150.54	0.23	.9959438	44.0	1 33 59.72
27	58	339 3 17.1	3 2.7	150.46	+0.11	.9960504	44.7	1 30 3.80
28	59	340 3 27.6	3 13.1	150.39	−0.02	.9961588	45.4	1 26 7.90
29	60	341 3 36.2	3 21.6	150.32	−0.14	9.9962688	+46.1	1 22 12.00

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour. —9^{s}.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER. Noon.	SEMIDIAMETER. Midnight.	HORIZONTAL PARALLAX. Noon.	HORIZONTAL PARALLAX. Diff. for 1 hour.	HORIZONTAL PARALLAX. Midnight.	HORIZONTAL PARALLAX. Diff. for 1 hour.	MERIDIAN PASSAGE.	MERIDIAN PASSAGE. Diff. for 1 hour.	AGE. Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 17.9	16 10.3	59 42.3	−2.27	59 14.3	−2.39	15 27.3	1.97	17.9
2	16 2.4	15 54.3	58 45.2	2.45	58 15.7	2.46	16 14.4	1.96	18.9
3	15 46.3	15 38.5	57 46.3	2.42	57 17.7	2.34	17 1.8	1.99	19.9
4	15 31.0	15 24.0	56 50.3	2.22	56 24.5	2.08	17 50.4	2.06	20.9
5	15 17.5	15 11.5	56 0.5	1.91	55 38.6	1.74	18 40.5	2.12	21.9
6	15 6.1	15 1.3	55 18.8	1.56	55 1.2	1.37	19 32.1	2.17	22.9
7	14 57.2	14 53.6	54 45.9	1.18	54 32.8	1.00	20 24.4	2.18	23.9
8	14 50.6	14 48.3	54 21.9	0.82	54 13.1	0.65	21 16.2	2.13	24.9
9	14 46.4	14 45.0	54 6.3	0.49	54 1.4	0.33	22 6.4	2.04	25.9
10	14 44.2	14 43.8	53 58.3	−0.19	53 56.9	−0.05	22 54.2	1.94	26.9
11	14 43.9	14 44.3	53 57.1	+0.08	53 58.7	+0.19	23 39.4	1.83	27.9
12	14 45.1	14 46.3	54 1.7	0.31	54 6.0	0.41	δ		28.9
13	14 47.8	14 49.5	54 11.4	0.50	54 17.9	0.59	0 22.2	1.74	0.1
14	14 51.7	14 54.0	54 25.6	0.69	54 34.4	0.78	1 3.3	1.68	1.1
15	14 56.8	14 59.8	54 44.4	0.88	54 55.6	0.96	1 43.4	1.67	2.1
16	15 3.2	15 6.9	55 7.9	1.07	55 21.4	1.17	2 23.7	1.70	3.1
17	15 10.8	15 15.2	55 36.1	1.28	55 52.1	1.38	3 5.2	1.77	4.1
18	15 19.9	15 24.9	56 9.3	1.49	56 27.8	1.59	3 49.2	1.90	5.1
19	15 30.3	15 36.0	56 47.5	1.69	57 8.4	1.79	4 36.7	2.08	6.1
20	15 41.9	15 48.1	57 30.3	1.87	57 53.1	1.93	5 29.0	2.29	7.1
21	15 54.5	16 1.0	58 16.5	1.97	58 40.2	1.97	6 26.4	2.49	8.1
22	16 7.2	16 13.5	59 3.6	1.93	59 26.4	1.86	7 28.1	2.64	9.1
23	16 19.5	16 24.9	59 48.1	1.75	60 8.1	1.58	8 31.9	2.66	10.1
24	16 29.6	16 33.7	60 25.7	1.35	60 40.3	1.08	9 35.0	2.56	11.1
25	16 36.8	16 38.7	60 51.5	0.77	60 58.7	+0.42	10 35.0	2.42	12.1
26	16 39.5	16 39.0	61 1.5	+0.05	60 59.8	−0.33	11 31.2	2.26	13.1
27	16 37.3	16 34.4	60 53.6	−0.71	60 42.9	1.07	12 23.7	2.13	14.1
28	16 30.3	16 25.2	60 28.0	1.41	60 9.3	1.70	13 13.7	2.05	15.1
29	16 19.3	16 12.6	59 47.4	−1.94	59 22.9	−2.14	14 2.5	2.02	16.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 44 42.04	2.1100	N. 0 7 0.8	17.149	0	13 24 15.88	2.0695	S. 12 44 57.7	14.547
1	11 46 48.55	2.1071	S. 0 10 7.5	17.126	1	13 26 20.08	2.0705	12 59 28.1	14.465
2	11 48 54.89	2.1043	0 27 14.3	17.101	2	13 28 24.34	2.0715	13 13 53.5	14.382
3	11 51 1.07	2.1017	0 44 19.6	17.075	3	13 30 28.66	2.0726	13 28 13.9	14.298
4	11 53 7.10	2.0992	1 1 23.3	17.047	4	13 32 33.05	2.0738	13 42 29.2	14.213
5	11 55 12.98	2.0967	1 18 25.2	17.018	5	13 34 37.51	2.0750	13 56 39.5	14.128
6	11 57 18.71	2.0942	1 35 25.4	16.987	6	13 36 42.05	2.0763	14 10 44.6	14.041
7	11 59 24.29	2.0919	1 52 23.7	16.955	7	13 38 46.67	2.0777	14 24 44.4	13.953
8	12 1 29.74	2.0898	2 9 20.0	16.922	8	13 40 51.37	2.0790	14 38 39.0	13.866
9	12 3 35.07	2.0877	2 26 14.3	16.887	9	13 42 56.15	2.0804	14 52 28.3	13.777
10	12 5 40.27	2.0857	2 43 6.4	16.850	10	13 45 1.02	2.0820	15 6 12.2	13.686
11	12 7 45.35	2.0837	2 59 56.3	16.812	11	13 47 5.99	2.0837	15 19 50.6	13.594
12	12 9 50.32	2.0819	3 16 43.9	16.773	12	13 49 11.06	2.0853	15 33 23.5	13.502
13	12 11 55.18	2.0802	3 33 29.1	16.732	13	13 51 16.22	2.0869	15 46 50.8	13.409
14	12 13 59.94	2.0785	3 50 11.8	16.691	14	13 53 21.48	2.0886	16 0 12.6	13.317
15	12 16 4.60	2.0769	4 6 52.0	16.648	15	13 55 26.85	2.0903	16 13 28.8	13.223
16	12 18 9.17	2.0755	4 23 29.5	16.603	16	13 57 32.32	2.0921	16 26 39.3	13.127
17	12 20 13.66	2.0741	4 40 4.3	16.558	17	13 59 37.90	2.0940	16 39 44.0	13.030
18	12 22 18.06	2.0727	4 56 36.4	16.511	18	14 1 43.60	2.0959	16 52 42.9	12.932
19	12 24 22.38	2.0714	5 13 5.6	16.462	19	14 3 49.41	2.0978	17 5 35.9	12.835
20	12 26 26.63	2.0702	5 29 31.8	16.412	20	14 5 55.34	2.0998	17 18 23.1	12.737
21	12 28 30.81	2.0692	5 45 55.0	16.361	21	14 8 1.39	2.1018	17 31 4.3	12.637
22	12 30 34.93	2.0682	6 2 15.1	16.308	22	14 10 7.56	2.1039	17 43 39.5	12.536
23	12 32 39.00	2.0674	S. 6 18 32.0	16.254	23	14 12 13.86	2.1060	S. 17 56 8.6	12.434
	FRIDAY 2.					**SUNDAY 4.**			
0	12 34 43.02	2.0666	S. 6 34 45.6	16.199	0	14 14 20.28	2.1081	S. 18 8 31.6	12.339
1	12 36 46.99	2.0658	6 50 55.9	16.143	1	14 16 26.83	2.1103	18 20 48.5	12.230
2	12 38 50.91	2.0651	7 7 2.8	16.087	2	14 18 33.51	2.1125	18 32 59.2	12.126
3	12 40 54.80	2.0646	7 23 6.3	16.028	3	14 20 40.33	2.1148	18 45 3.6	12.022
4	12 42 58.66	2.0641	7 39 6.2	15.968	4	14 22 47.29	2.1171	18 57 1.8	11.917
5	12 45 2.49	2.0637	7 55 2.5	15.907	5	14 24 54.38	2.1193	19 8 53.7	11.811
6	12 47 6.30	2.0633	8 10 55.1	15.845	6	14 27 1.61	2.1217	19 20 39.1	11.703
7	12 49 10.09	2.0630	8 26 43.9	15.782	7	14 29 8.98	2.1240	19 32 18.1	11.596
8	12 51 13.86	2.0627	8 42 29.0	15.719	8	14 31 16.49	2.1264	19 43 50.6	11.488
9	12 53 17.61	2.0625	8 58 10.2	15.654	9	14 33 24.15	2.1288	19 55 16.7	11.380
10	12 55 21.36	2.0626	9 13 47.5	15.587	10	14 35 31.95	2.1312	20 6 36.2	11.270
11	12 57 25.12	2.0627	9 29 20.7	15.519	11	14 37 39.90	2.1337	20 17 49.1	11.159
12	12 59 28.88	2.0628	9 44 49.8	15.450	12	14 39 47.99	2.1361	20 28 55.3	11.047
13	13 1 32.65	2.0629	10 0 14.7	15.380	13	14 41 56.23	2.1387	20 39 54.8	10.936
14	13 3 36.43	2.0632	10 15 35.4	15.310	14	14 44 4.63	2.1412	20 50 47.6	10.824
15	13 5 40.23	2.0636	10 30 51.9	15.239	15	14 46 13.18	2.1437	21 1 33.7	10.711
16	13 7 44.05	2.0638	10 46 4.1	15.167	16	14 48 21.88	2.1462	21 12 12.9	10.596
17	13 9 47.89	2.0642	11 1 11.9	15.093	17	14 50 30.73	2.1487	21 22 45.2	10.481
18	13 11 51.76	2.0648	11 16 15.2	15.017	18	14 52 39.73	2.1513	21 33 10.6	10.366
19	13 13 55.67	2.0655	11 31 13.9	14.941	19	14 54 48.89	2.1539	21 43 29.1	10.250
20	13 15 59.62	2.0662	11 46 8.1	14.864	20	14 56 58.20	2.1565	21 53 40.6	10.133
21	13 18 3.61	2.0669	12 0 57.6	14.786	21	14 59 7.67	2.1592	22 3 45.0	10.015
22	13 20 7.65	2.0677	12 15 42.4	14.707	22	15 1 17.30	2.1618	22 13 42.4	9.897
23	13 22 11.74	2.0686	12 30 22.5	14.627	23	15 3 27.08	2.1643	22 23 32.7	9.778
24	13 24 15.88	2.0695	S. 12 44 57.7	14.547	24	15 5 37.02	2.1669	S. 22 33 15.8	9.658

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 5 37.02	2.1669	S.22 33 15.8	9.658
1	15 7 47.11	2.1695	22 42 51.7	9.538
2	15 9 57.36	2.1722	22 52 20.4	9.418
3	15 12 7.77	2.1748	23 1 41.9	9.298
4	15 14 18.33	2.1773	23 10 56.1	9.176
5	15 16 29.05	2.1799	23 20 3.0	9.053
6	15 18 39.92	2.1825	23 29 2.4	8.929
7	15 20 50.95	2.1851	23 37 54.4	8.805
8	15 23 2.13	2.1877	23 46 39.0	8.681
9	15 25 13.47	2.1902	23 55 16.1	8.556
10	15 27 24.96	2.1927	24 3 45.7	8.430
11	15 29 36.60	2.1952	24 12 7.7	8.303
12	15 31 48.39	2.1977	24 20 22.1	8.176
13	15 34 0.33	2.2002	24 28 28.9	8.049
14	15 36 12.42	2.2027	24 36 28.0	7.922
15	15 38 24.66	2.2052	24 44 19.5	7.793
16	15 40 37.04	2.2076	24 52 3.2	7.664
17	15 42 49.57	2.2100	24 59 39.2	7.535
18	15 45 2.24	2.2123	25 7 7.4	7.405
19	15 47 15.05	2.2147	25 14 27.8	7.274
20	15 49 28.00	2.2170	25 21 40.3	7.142
21	15 51 41.09	2.2192	25 28 44.9	7.011
22	15 53 54.31	2.2214	25 35 41.6	6.879
23	15 56 7.66	2.2237	S.25 42 30.4	6.747

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 58 21.15	2.2259	S.25 49 11.3	6.615
1	16 0 34.77	2.2280	25 55 44.2	6.481
2	16 2 48.51	2.2301	26 2 9.0	6.347
3	16 5 2.38	2.2322	26 8 25.8	6.213
4	16 7 16.37	2.2342	26 14 34.6	6.078
5	16 9 30.48	2.2361	26 20 35.2	5.942
6	16 11 44.70	2.2380	26 26 27.7	5.807
7	16 13 59.04	2.2399	26 32 12.1	5.672
8	16 16 13.49	2.2417	26 37 48.3	5.535
9	16 18 28.04	2.2434	26 43 16.3	5.398
10	16 20 42.70	2.2452	26 48 36.1	5.262
11	16 22 57.47	2.2470	26 53 47.7	5.125
12	16 25 12.34	2.2486	26 58 51.1	4.987
13	16 27 27.30	2.2501	27 3 46.2	4.849
14	16 29 42.35	2.2516	27 8 33.0	4.711
15	16 31 57.49	2.2530	27 13 11.5	4.572
16	16 34 12.71	2.2544	27 17 41.7	4.434
17	16 36 28.02	2.2558	27 22 3.6	4.295
18	16 38 43.41	2.2571	27 26 17.1	4.155
19	16 40 58.87	2.2582	27 30 22.2	4.016
20	16 43 14.40	2.2593	27 34 19.0	3.877
21	16 45 29.99	2.2603	27 38 7.4	3.737
22	16 47 45.64	2.2613	27 41 47.4	3.597
23	16 50 1.35	2.2623	27 45 19.0	3.456
24	16 52 17.12	2.2632	S.27 48 42.1	3.315

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 52 17.12	2.2632	S.27 48 42.1	3.315
1	16 54 32.94	2.2640	27 51 56.8	3.175
2	16 56 48.80	2.2648	27 55 3.1	3.034
3	16 59 4.71	2.2655	27 58 0.9	2.893
4	17 1 20.66	2.2661	28 0 50.2	2.752
5	17 3 36.64	2.2665	28 3 31.1	2.611
6	17 5 52.64	2.2669	28 6 3.5	2.469
7	17 8 8.67	2.2673	28 8 27.4	2.328
8	17 10 24.72	2.2677	28 10 42.9	2.187
9	17 12 40.79	2.2679	28 12 49.9	2.046
10	17 14 56.87	2.2680	28 14 48.4	1.904
11	17 17 12.95	2.2680	28 16 38.4	1.762
12	17 19 29.03	2.2680	28 18 19.9	1.621
13	17 21 45.11	2.2679	28 19 52.9	1.479
14	17 24 1.18	2.2678	28 21 17.4	1.338
15	17 26 17.24	2.2676	28 22 33.5	1.198
16	17 28 33.29	2.2673	28 23 41.1	1.056
17	17 30 49.32	2.2669	28 24 40.2	0.914
18	17 33 5.32	2.2664	28 25 30.7	0.772
19	17 35 21.29	2.2658	28 26 12.8	0.632
20	17 37 37.22	2.2652	28 26 46.5	0.491
21	17 39 53.11	2.2645	28 27 11.7	0.350
22	17 42 8.96	2.2637	28 27 28.5	0.209
23	17 44 24.76	2.2628	S.28 27 36.8	−0.068

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 46 40.50	2.2618	S.28 27 36.7	+0.073
1	17 48 56.18	2.2608	28 27 28.1	0.212
2	17 51 11.80	2.2597	28 27 11.2	0.352
3	17 53 27.35	2.2586	28 26 45.9	0.492
4	17 55 42.83	2.2573	28 26 12.2	0.632
5	17 57 58.23	2.2560	28 25 30.1	0.772
6	18 0 13.55	2.2546	28 24 39.6	0.911
7	18 2 28.78	2.2531	28 23 40.8	1.049
8	18 4 43.92	2.2515	28 22 33.7	1.187
9	18 6 58.96	2.2498	28 21 18.3	1.326
10	18 9 13.90	2.2481	28 19 54.6	1.464
11	18 11 28.74	2.2463	28 18 22.6	1.602
12	18 13 43.46	2.2444	28 16 42.4	1.739
13	18 15 58.07	2.2425	28 14 53.9	1.876
14	18 18 12.56	2.2405	28 12 57.2	2.013
15	18 20 26.93	2.2384	28 10 52.4	2.148
16	18 22 41.17	2.2362	28 8 39.4	2.284
17	18 24 55.28	2.2340	28 6 18.3	2.420
18	18 27 9.25	2.2317	28 3 49.0	2.556
19	18 29 23.08	2.2293	28 1 11.6	2.690
20	18 31 36.77	2.2269	27 58 26.2	2.823
21	18 33 50.31	2.2244	27 55 32.8	2.957
22	18 36 3.70	2.2218	27 52 31.4	3.090
23	18 38 16.93	2.2192	27 49 22.0	3.223
24	18 40 30.00	2.2165	S.27 46 4.6	3.356

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 40 30.00	2.2165	S. 27 46 4.6	3.356	0	20 22 51.79	2.0367	S. 22 44 25.4	8.937
1	18 42 42.91	2.2137	27 42 39.3	3.487	1	20 24 53.86	2.0324	22 35 26.3	9.034
2	18 44 55.65	2.2108	27 39 6.1	3.618	2	20 26 55.68	2.0282	22 26 21.3	9.131
3	18 47 8.21	2.2079	27 35 25.1	3.748	3	20 28 57.25	2.0241	22 17 10.5	9.227
4	18 49 20.60	2.2051	27 31 36.3	3.879	4	20 30 58.57	2.0198	22 7 54.0	9.322
5	18 51 32.82	2.2022	27 27 39.6	4.010	5	20 32 59.63	2.0156	21 58 31.9	9.416
6	18 53 44.86	2.1991	27 23 35.1	4.139	6	20 35 0.44	2.0114	21 49 4.1	9.510
7	18 55 56.71	2.1959	27 19 22.9	4.267	7	20 37 1.00	2.0072	21 39 30.7	9.602
8	18 58 8.37	2.1927	27 15 3.1	4.394	8	20 39 1.31	2.0031	21 29 51.9	9.693
9	19 0 19.83	2.1894	27 10 35.6	4.522	9	20 41 1.37	1.9989	21 20 7.6	9.784
10	19 2 31.10	2.1862	27 6 0.5	4.648	10	20 43 1.18	1.9948	21 10 17.8	9.874
11	19 4 42.18	2.1830	27 1 17.8	4.774	11	20 45 0.75	1.9907	21 0 22.7	9.963
12	19 6 53.06	2.1796	26 56 27.6	4.899	12	20 47 0.07	1.9866	20 50 22.3	10.051
13	19 9 3.73	2.1761	26 51 29.9	5.024	13	20 48 59.14	1.9825	20 40 16.6	10.138
14	19 11 14.19	2.1726	26 46 24.7	5.149	14	20 50 57.97	1.9785	20 30 5.7	10.224
15	19 13 24.44	2.1691	26 41 12.0	5.273	15	20 52 56.56	1.9744	20 19 49.7	10.309
16	19 15 34.48	2.1655	26 35 51.9	5.396	16	20 54 54.90	1.9703	20 9 28.6	10.394
17	19 17 44.30	2.1619	26 30 24.5	5.518	17	20 56 53.00	1.9663	19 59 2.4	10.478
18	19 19 53.91	2.1583	26 24 49.8	5.639	18	20 58 50.86	1.9623	19 48 31.2	10.561
19	19 22 3.30	2.1546	26 19 7.8	5.760	19	21 0 48.48	1.9584	19 37 55.1	10.643
20	19 24 12.46	2.1508	26 13 18.6	5.880	20	21 2 45.87	1.9545	19 27 14.0	10.725
21	19 26 21.40	2.1471	26 7 22.2	6.000	21	21 4 43.02	1.9506	19 16 28.1	10.805
22	19 28 30.11	2.1433	26 1 18.6	6.119	22	21 6 39.94	1.9467	19 5 37.4	10.885
23	19 30 38.59	2.1394	S. 25 55 7.9	6.237	23	21 8 36.63	1.9428	S. 18 54 41.9	10.963
	SATURDAY 10.					MONDAY 12.			
0	19 32 46.84	2.1356	S. 25 48 50.2	6.353	0	21 10 33.08	1.9389	S. 18 43 41.8	11.041
1	19 34 54.86	2.1317	25 42 25.5	6.470	1	21 12 29.30	1.9352	18 32 37.0	11.118
2	19 37 2.64	2.1277	25 35 53.8	6.587	2	21 14 25.30	1.9315	18 21 27.6	11.194
3	19 39 10.18	2.1238	25 29 15.1	6.703	3	21 16 21.08	1.9278	18 10 13.7	11.269
4	19 41 17.49	2.1198	25 22 29.5	6.817	4	21 18 16.64	1.9241	17 58 55.3	11.343
5	19 43 24.56	2.1158	25 15 37.1	6.929	5	21 20 11.97	1.9203	17 47 32.5	11.417
6	19 45 31.38	2.1117	25 8 38.0	7.042	6	21 22 7.08	1.9167	17 36 5.3	11.489
7	19 47 37.96	2.1077	25 1 32.1	7.154	7	21 24 1.98	1.9132	17 24 33.8	11.561
8	19 49 44.30	2.1036	24 54 19.5	7.266	8	21 25 56.66	1.9096	17 12 58.0	11.632
9	19 51 50.39	2.0995	24 47 0.2	7.377	9	21 27 51.13	1.9061	17 1 17.9	11.703
10	19 53 56.24	2.0954	24 39 34.3	7.486	10	21 29 45.39	1.9027	16 49 33.6	11.772
11	19 56 1.84	2.0912	24 32 1.9	7.594	11	21 31 39.45	1.8992	16 37 45.3	11.839
12	19 58 7.19	2.0871	24 24 23.0	7.702	12	21 33 33.30	1.8958	16 25 52.9	11.907
13	20 0 12.29	2.0829	24 16 37.6	7.810	13	21 35 26.95	1.8925	16 13 56.4	11.974
14	20 2 17.14	2.0787	24 8 45.8	7.917	14	21 37 20.40	1.8892	16 1 56.0	12.039
15	20 4 21.74	2.0746	24 0 47.6	8.023	15	21 39 13.65	1.8858	15 49 51.7	12.104
16	20 6 26.09	2.0704	23 52 43.1	8.128	16	21 41 6.70	1.8826	15 37 43.5	12.169
17	20 8 30.19	2.0662	23 44 32.3	8.232	17	21 42 59.56	1.8794	15 25 31.4	12.232
18	20 10 34.03	2.0619	23 36 15.3	8.336	18	21 44 52.23	1.8763	15 13 15.6	12.294
19	20 12 37.62	2.0577	23 27 52.1	8.437	19	21 46 44.71	1.8732	15 0 56.1	12.356
20	20 14 40.96	2.0536	23 19 22.8	8.538	20	21 48 37.01	1.8702	14 48 32.9	12.417
21	20 16 44.05	2.0493	23 10 47.5	8.639	21	21 50 29.13	1.8672	14 36 6.1	12.477
22	20 18 46.88	2.0451	23 2 6.1	8.740	22	21 52 21.07	1.8642	14 23 35.7	12.536
23	20 20 49.46	2.0409	22 53 18.7	8.839	23	21 54 12.83	1.8612	14 11 1.8	12.594
24	20 22 51.79	2.0367	S. 22 44 25.4	8.937	24	21 56 4.41	1.8584	S. 13 58 24.4	12.652

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 56 4.41	1.8584	S. 13 58 24.4	12.652
1	21 57 55.83	1.8556	13 45 43.6	12.708
2	21 59 47.08	1.8527	13 32 59.5	12.763
3	22 1 38.16	1.8500	13 20 12.0	12.819
4	22 3 29.08	1.8474	13 7 21.2	12.873
5	22 5 19.85	1.8448	12 54 27.3	12.925
6	22 7 10.46	1.8422	12 41 30.2	12.977
7	22 9 0.92	1.8397	12 28 30.0	13.029
8	22 10 51.23	1.8372	12 15 26.7	13.080
9	22 12 41.39	1.8348	12 2 20.4	13.130
10	22 14 31.41	1.8325	11 49 11.1	13.179
11	22 16 21.29	1.8302	11 35 58.9	13.227
12	22 18 11.04	1.8280	11 22 43.8	13.275
13	22 20 0.65	1.8258	11 9 25.9	13.321
14	22 21 50.13	1.8237	10 56 5.3	13.367
15	22 23 39.49	1.8217	10 42 41.9	13.413
16	22 25 28.73	1.8196	10 29 15.8	13.457
17	22 27 17.84	1.8175	10 15 47.1	13.499
18	22 29 6.83	1.8156	10 2 15.9	13.541
19	22 30 55.71	1.8138	9 48 42.2	13.583
20	22 32 44.49	1.8121	9 35 5.9	13.625
21	22 34 33.16	1.8103	9 21 27.2	13.665
22	22 36 21.73	1.8087	9 7 46.1	13.704
23	22 38 10.20	1.8070	S. 8 54 2.7	13.742

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 39 58.57	1.8054	S. 8 40 17.1	13.779
1	22 41 46.85	1.8040	8 26 29.2	13.816
2	22 43 35.05	1.8026	8 12 39.1	13.852
3	22 45 23.16	1.8012	7 58 46.9	13.887
4	22 47 11.19	1.7999	7 44 52.6	13.922
5	22 48 59.15	1.7987	7 30 56.3	13.955
6	22 50 47.03	1.7974	7 16 58.0	13.988
7	22 52 34.84	1.7963	7 2 57.7	14.020
8	22 54 22.59	1.7953	6 48 55.6	14.051
9	22 56 10.28	1.7943	6 34 51.6	14.082
10	22 57 57.91	1.7934	6 20 45.8	14.111
11	22 59 45.49	1.7926	6 6 38.3	14.140
12	23 1 33.02	1.7918	5 52 29.0	14.168
13	23 3 20.50	1.7910	5 38 18.1	14.195
14	23 5 7.94	1.7903	5 24 5.6	14.221
15	23 6 55.34	1.7897	5 9 51.6	14.246
16	23 8 42.71	1.7892	4 55 36.1	14.271
17	23 10 30.05	1.7887	4 41 19.1	14.296
18	23 12 17.36	1.7883	4 27 0.6	14.319
19	23 14 4.65	1.7880	4 12 40.8	14.341
20	23 15 51.92	1.7878	3 58 19.7	14.362
21	23 17 39.18	1.7876	3 43 57.4	14.382
22	23 19 26.43	1.7874	3 29 33.9	14.402
23	23 21 13.67	1.7873	3 15 9.2	14.422
24	23 23 0.91	1.7873	S. 3 0 43.3	14.440

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 23 0.91	1.7873	S. 3 0 43.3	14.440
1	23 24 48.15	1.7874	2 46 16.4	14.457
2	23 26 35.40	1.7876	2 31 48.5	14.473
3	23 28 22.66	1.7878	2 17 19.6	14.489
4	23 30 9.94	1.7881	2 2 49.8	14.504
5	23 31 57.23	1.7884	1 48 19.1	14.519
6	23 33 44.55	1.7889	1 33 47.5	14.532
7	23 35 31.90	1.7893	1 19 15.2	14.544
8	23 37 19.27	1.7898	1 4 42.2	14.556
9	23 39 6.67	1.7904	0 50 8.5	14.567
10	23 40 54.12	1.7912	0 35 34.2	14.577
11	23 42 41.62	1.7921	0 20 59.3	14.587
12	23 44 29.17	1.7929	S. 0 6 23.8	14.596
13	23 46 16.77	1.7938	N. 0 8 12.2	14.602
14	23 48 4.43	1.7948	0 22 48.5	14.608
15	23 49 52.15	1.7958	0 37 25.2	14.614
16	23 51 39.93	1.7969	0 52 2.2	14.619
17	23 53 27.78	1.7982	1 6 39.5	14.624
18	23 55 15.71	1.7995	1 21 17.1	14.628
19	23 57 3.72	1.8009	1 35 54.9	14.630
20	23 58 51.82	1.8023	1 50 32.7	14.631
21	0 0 40.00	1.8037	2 5 10.6	14.632
22	0 2 28.27	1.8053	2 19 48.6	14.633
23	0 4 16.64	1.8071	N. 2 34 26.6	14.632

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 6 5.12	1.8088	N. 2 49 4.4	14.629
1	0 7 53.70	1.8106	3 3 42.1	14.626
2	0 9 42.39	1.8125	3 18 19.6	14.623
3	0 11 31.20	1.8145	3 32 56.9	14.619
4	0 13 20.13	1.8165	3 47 33.9	14.614
5	0 15 9.18	1.8186	4 2 10.6	14.608
6	0 16 58.36	1.8208	4 16 46.9	14.601
7	0 18 47.68	1.8232	4 31 22.7	14.593
8	0 20 37.14	1.8255	4 45 58.1	14.585
9	0 22 26.74	1.8278	5 0 32.9	14.575
10	0 24 16.48	1.8302	5 15 7.1	14.564
11	0 26 6.37	1.8328	5 29 40.6	14.552
12	0 27 56.42	1.8355	5 44 13.4	14.540
13	0 29 46.63	1.8383	5 58 45.4	14.527
14	0 31 37.01	1.8411	6 13 16.6	14.513
15	0 33 27.56	1.8440	6 27 46.9	14.498
16	0 35 18.29	1.8470	6 42 16.3	14.482
17	0 37 9.20	1.8500	6 56 44.7	14.464
18	0 39 0.29	1.8531	7 11 12.0	14.446
19	0 40 51.57	1.8563	7 25 38.2	14.427
20	0 42 43.05	1.8597	7 40 3.2	14.407
21	0 44 34.73	1.8630	7 54 27.1	14.387
22	0 46 26.61	1.8664	8 8 49.7	14.365
23	0 48 18.70	1.8699	8 23 10.9	14.342
24	0 50 11.00	1.8735	N. 8 37 30.7	14.318

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 50 11.00	1.8735	N. 8 37 30.7	14.318
1	0 52 3.52	1.8772	8 51 49.0	14.293
2	0 53 56.26	1.8809	9 6 5.9	14.268
3	0 55 49.23	1.8847	9 20 21.2	14.242
4	0 57 42.43	1.8887	9 34 34.9	14.213
5	0 59 35.87	1.8927	9 48 46.8	14.183
6	1 1 29.56	1.8968	10 2 56.9	14.153
7	1 3 23.49	1.9009	10 17 5.2	14.123
8	1 5 17.67	1.9051	10 31 11.7	14.092
9	1 7 12.10	1.9093	10 45 16.2	14.058
10	1 9 6.79	1.9137	10 59 18.7	14.024
11	1 11 1.75	1.9183	11 13 19.1	13.989
12	1 12 56.99	1.9229	11 27 17.4	13.953
13	1 14 52.50	1.9275	11 41 13.5	13.916
14	1 16 48.29	1.9322	11 55 7.3	13.878
15	1 18 44.36	1.9369	12 8 58.8	13.838
16	1 20 40.72	1.9417	12 22 47.9	13.797
17	1 22 37.37	1.9467	12 36 34.5	13.756
18	1 24 34.33	1.9518	12 50 18.6	13.713
19	1 26 31.59	1.9569	13 4 0.1	13.669
20	1 28 29.16	1.9621	13 17 38.9	13.624
21	1 30 27.04	1.9674	13 31 15.0	13.578
22	1 32 25.24	1.9727	13 44 48.3	13.531
23	1 34 23.76	1.9780	N.13 58 18.7	13.482

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 36 22.60	1.9834	N.14 11 46.1	13.432
1	1 38 21.77	1.9890	14 25 10.5	13.382
2	1 40 21.28	1.9947	14 38 31.9	13.330
3	1 42 21.14	2.0005	14 51 50.1	13.277
4	1 44 21.34	2.0063	15 5 5.1	13.222
5	1 46 21.89	2.0121	15 18 16.7	13.165
6	1 48 22.79	2.0180	15 31 24.9	13.108
7	1 50 24.05	2.0240	15 44 29.7	13.050
8	1 52 25.67	2.0301	15 57 30.9	12.990
9	1 54 27.66	2.0362	16 10 28.5	12.930
10	1 56 30.02	2.0424	16 23 22.5	12.868
11	1 58 32.75	2.0487	16 36 12.7	12.804
12	2 0 35.86	2.0550	16 48 59.0	12.739
13	2 2 39.35	2.0614	17 1 41.4	12.673
14	2 4 43.23	2.0680	17 14 19.8	12.607
15	2 6 47.51	2.0747	17 26 54.2	12.538
16	2 8 52.19	2.0813	17 39 24.4	12.467
17	2 10 57.27	2.0880	17 51 50.3	12.396
18	2 13 2.75	2.0948	18 4 11.9	12.323
19	2 15 8.64	2.1016	18 16 29.1	12.249
20	2 17 14.94	2.1084	18 28 41.8	12.173
21	2 19 21.65	2.1153	18 40 49.9	12.097
22	2 21 28.78	2.1224	18 52 53.4	12.018
23	2 23 36.34	2.1295	19 4 52.1	11.938
24	2 25 44.32	2.1366	N.19 16 46.0	11.857

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	2 25 44.32	2.1366	N.19 16 46.0	11.857
1	2 27 52.73	2.1438	19 28 35.0	11.775
2	2 30 1.58	2.1511	19 40 19.0	11.691
3	2 32 10.86	2.1583	19 51 57.9	11.605
4	2 34 20.58	2.1657	20 8 31.6	11.517
5	2 36 30.74	2.1731	20 15 0.0	11.429
6	2 38 41.35	2.1806	20 26 23.1	11.340
7	2 40 52.41	2.1881	20 37 40.8	11.248
8	2 43 3.92	2.1956	20 48 52.9	11.154
9	2 45 15.88	2.2032	20 59 59.3	11.059
10	2 47 28.30	2.2108	21 11 0.0	10.963
11	2 49 41.18	2.2185	21 21 54.9	10.866
12	2 51 54.52	2.2262	21 32 43.9	10.767
13	2 54 8.33	2.2340	21 43 26.9	10.666
14	2 56 22.60	2.2418	21 54 3.8	10.563
15	2 58 37.34	2.2496	22 4 34.5	10.459
16	3 0 52.55	2.2574	22 14 58.9	10.354
17	3 3 8.23	2.2653	22 25 17.0	10.247
18	3 5 24.39	2.2732	22 35 28.6	10.138
19	3 7 41.02	2.2812	22 45 33.6	10.028
20	3 9 58.13	2.2891	22 55 32.0	9.917
21	3 12 15.71	2.2970	23 5 23.6	9.803
22	3 14 33.77	2.3051	23 15 8.3	9.688
23	3 16 52.32	2.3132	N.23 24 46.1	9.571

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	3 19 11.35	2.3212	N.23 34 16.8	9.452
1	3 21 30.86	2.3292	23 43 40.4	9.332
2	3 23 50.85	2.3372	23 52 56.7	9.210
3	3 26 11.32	2.3452	24 2 5.6	9.087
4	3 28 32.27	2.3532	24 11 7.1	8.962
5	3 30 53.70	2.3612	24 20 1.1	8.836
6	3 33 15.62	2.3693	24 28 47.4	8.708
7	3 35 38.02	2.3773	24 37 26.0	8.577
8	3 38 0.90	2.3853	24 45 56.7	8.445
9	3 40 24.26	2.3933	24 54 19.4	8.312
10	3 42 48.10	2.4012	25 2 34.1	8.177
11	3 45 12.41	2.4092	25 10 40.7	8.041
12	3 47 37.20	2.4172	25 18 39.0	7.903
13	3 50 2.47	2.4251	25 26 29.0	7.763
14	3 52 28.21	2.4329	25 34 10.5	7.621
15	3 54 54.42	2.4408	25 41 43.5	7.478
16	3 57 21.10	2.4486	25 49 7.9	7.333
17	3 59 48.25	2.4563	25 56 23.5	7.186
18	4 2 15.86	2.4640	26 3 30.2	7.037
19	4 4 43.93	2.4717	26 10 28.0	6.888
20	4 7 12.46	2.4793	26 17 16.8	6.737
21	4 9 41.45	2.4869	26 23 56.5	6.584
22	4 12 10.89	2.4944	26 30 26.9	6.429
23	4 14 40.78	2.5018	26 36 48.0	6.273
24	4 17 11.11	2.5092	N.26 42 59.7	6.116

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 17 11.11	2.5092	N.26 42 59.7	6.116
1	4 19 41.88	2.5165	26 49 1.9	5.957
2	4 22 13.09	2.5237	26 54 54.5	5.795
3	4 24 44.73	2.5308	27 0 37.3	5.632
4	4 27 16.79	2.5379	27 6 10.3	5.468
5	4 29 49.28	2.5449	27 11 33.5	5.303
6	4 32 22.18	2.5518	27 16 46.7	5.136
7	4 34 55.49	2.5586	27 21 49.8	4.967
8	4 37 29.21	2.5653	27 26 42.8	4.797
9	4 40 3.33	2.5719	27 31 25.5	4.626
10	4 42 37.84	2.5784	27 35 57.9	4.453
11	4 45 12.74	2.5848	27 40 19.9	4.279
12	4 47 48.02	2.5911	27 44 31.4	4.103
13	4 50 23.67	2.5972	27 48 32.3	3.927
14	4 52 59.69	2.6033	27 52 22.6	3.748
15	4 55 36.07	2.6092	27 56 2.1	3.568
16	4 58 12.80	2.6150	27 59 30.8	3.387
17	5 0 49.87	2.6207	28 2 48.6	3.204
18	5 3 27.28	2.6263	28 5 55.3	3.020
19	5 6 5.02	2.6317	28 8 51.0	2.836
20	5 8 43.08	2.6369	28 11 35.6	2.651
21	5 11 21.44	2.6419	28 14 9.1	2.464
22	5 14 0.11	2.6469	28 16 31.3	2.276
23	5 16 39.07	2.6518	N.28 18 42.2	2.086

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 19 18.32	2.6565	N.28 20 41.6	1.895
1	5 21 57.85	2.6610	28 22 29.6	1.704
2	5 24 37.64	2.6653	28 24 6.1	1.512
3	5 27 17.69	2.6696	28 25 31.0	1.318
4	5 29 57.99	2.6737	28 26 44.3	1.124
5	5 32 38.53	2.6775	28 27 45.9	0.929
6	5 35 19.29	2.6812	28 28 35.8	0.733
7	5 38 0.27	2.6848	28 29 13.9	0.537
8	5 40 41.46	2.6882	28 29 40.2	0.339
9	5 43 22.85	2.6914	28 29 54.6	+0.141
10	5 46 4.43	2.6944	28 29 57.1	−0.058
11	5 48 46.18	2.6972	28 29 47.6	0.258
12	5 51 28.09	2.6998	28 29 26.1	0.458
13	5 54 10.16	2.7023	28 28 52.6	0.659
14	5 56 52.37	2.7047	28 28 7.0	0.861
15	5 59 34.72	2.7068	28 27 9.3	1.062
16	6 2 17.19	2.7088	28 25 59.5	1.264
17	6 4 59.77	2.7106	28 24 37.6	1.467
18	6 7 42.46	2.7122	28 23 3.5	1.670
19	6 10 25.23	2.7135	28 21 17.2	1.873
20	6 13 8.08	2.7147	28 19 18.7	2.077
21	6 15 51.00	2.7157	28 17 8.0	2.281
22	6 18 33.97	2.7166	28 14 45.0	2.485
23	6 21 16.99	2.7173	28 12 9.8	2.688
24	6 24 0.04	2.7177	N.28 9 22.4	2.892

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 24 0.04	2.7177	N.28 9 22.4	2.892
1	6 26 43.11	2.7179	28 6 22.7	3.097
2	6 29 26.19	2.7181	28 3 10.8	3.301
3	6 32 9.28	2.7181	27 59 46.6	3.505
4	6 34 52.36	2.7178	27 56 10.2	3.709
5	6 37 35.41	2.7173	27 52 21.5	3.913
6	6 40 18.43	2.7167	27 48 20.6	4.117
7	6 43 1.41	2.7158	27 44 7.5	4.320
8	6 45 44.33	2.7148	27 39 42.2	4.522
9	6 48 27.19	2.7137	27 35 4.8	4.725
10	6 51 9.97	2.7123	27 30 15.2	4.927
11	6 53 52.67	2.7108	27 25 13.5	5.129
12	6 56 35.27	2.7091	27 19 59.7	5.330
13	6 59 17.76	2.7072	27 14 33.9	5.531
14	7 2 0.14	2.7052	27 8 56.0	5.732
15	7 4 42.39	2.7030	27 3 6.1	5.932
16	7 7 24.50	2.7006	26 57 4.2	6.130
17	7 10 6.46	2.6981	26 50 50.5	6.328
18	7 12 48.27	2.6954	26 44 24.9	6.525
19	7 15 29.91	2.6926	26 37 47.5	6.721
20	7 18 11.38	2.6896	26 30 58.4	6.917
21	7 20 52.66	2.6864	26 23 57.5	7.112
22	7 23 33.75	2.6832	26 16 45.0	7.305
23	7 26 14.64	2.6798	N.26 9 20.9	7.498

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 28 55.32	2.6762	N.26 1 45.2	7.690
1	7 31 35.78	2.6724	25 53 58.1	7.880
2	7 34 16.01	2.6685	25 45 59.6	8.070
3	7 36 56.00	2.6645	25 37 49.7	8.258
4	7 39 35.75	2.6604	25 29 28.6	8.445
5	7 42 15.25	2.6562	25 20 56.3	8.631
6	7 44 54.50	2.6519	25 12 12.9	8.815
7	7 47 33.48	2.6474	25 3 18.5	8.998
8	7 50 12.19	2.6427	24 54 13.1	9.181
9	7 52 50.61	2.6380	24 44 56.8	9.362
10	7 55 28.75	2.6332	24 35 29.7	9.541
11	7 58 6.60	2.6283	24 25 51.9	9.718
12	8 0 44.15	2.6233	24 16 3.5	9.894
13	8 3 21.40	2.6182	24 6 4.6	10.069
14	8 5 58.34	2.6130	23 55 55.2	10.242
15	8 8 34.96	2.6077	23 45 35.5	10.413
16	8 11 11.27	2.6024	23 35 5.6	10.583
17	8 13 47.25	2.5969	23 24 25.6	10.751
18	8 16 22.90	2.5914	23 13 35.5	10.917
19	8 18 58.22	2.5858	23 2 35.5	11.082
20	8 21 33.20	2.5802	22 51 25.7	11.245
21	8 24 7.84	2.5744	22 40 6.1	11.407
22	8 26 42.13	2.5686	22 28 36.9	11.566
23	8 29 16.07	2.5628	22 16 58.2	11.724
24	8 31 49.67	2.5570	N.22 5 10.0	11.880

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 31 49.67	2.5570	N.22 5 10.0	11.880	0	10 27 33.53	2.2744	N.10 14 13.9	16.916
1	8 34 22.91	2.5510	21 53 12.6	12.033	1	10 29 49.85	2.2695	9 57 17.4	16.967
2	8 36 55.79	2.5450	21 41 6.0	12.186	2	10 32 5.87	2.2646	9 40 17.8	17.017
3	8 39 28.31	2.5389	21 28 50.3	12.336	3	10 34 21.60	2.2598	9 23 15.3	17.065
4	8 42 0.46	2.5328	21 16 25.7	12.484	4	10 36 37.05	2.2552	9 6 10.0	17.110
5	8 44 32.25	2.5267	21 3 52.2	12.631	5	10 38 52.23	2.2507	8 49 2.1	17.153
6	8 47 3.67	2.5206	20 51 10.0	12.775	6	10 41 7.14	2.2462	8 31 51.6	17.195
7	8 49 34.72	2.5144	20 38 19.2	12.917	7	10 43 21.78	2.2417	8 14 38.7	17.234
8	8 52 5.40	2.5083	20 25 19.9	13.057	8	10 45 36.15	2.2374	7 57 23.5	17.271
9	8 54 35.71	2.5021	20 12 12.3	13.196	9	10 47 50.27	2.2332	7 40 6.2	17.306
10	8 57 5.65	2.4958	19 58 56.4	13.332	10	10 50 4.13	2.2289	7 22 46.8	17.338
11	8 59 35.21	2.4896	19 45 32.4	13.467	11	10 52 17.74	2.2248	7 5 25.6	17.368
12	9 2 4.40	2.4833	19 32 0.4	13.599	12	10 54 31.11	2.2208	6 48 2.6	17.397
13	9 4 33.21	2.4771	19 18 20.5	13.729	13	10 56 44.24	2.2168	6 30 38.0	17.423
14	9 7 1.65	2.4708	19 4 32.9	13.857	14	10 58 57.13	2.2129	6 13 11.8	17.449
15	9 9 29.71	2.4646	18 50 37.7	13.982	15	11 1 9.79	2.2092	5 55 44.1	17.472
16	9 11 57.40	2.4583	18 36 35.0	14.106	16	11 3 22.23	2.2055	5 38 15.1	17.492
17	9 14 24.71	2.4520	18 22 25.0	14.227	17	11 5 34.45	2.2018	5 20 45.0	17.510
18	9 16 51.64	2.4458	18 8 7.7	14.347	18	11 7 46.45	2.1982	5 3 13.9	17.526
19	9 19 18.20	2.4396	17 53 43.3	14.465	19	11 9 58.24	2.1947	4 45 41.9	17.541
20	9 21 44.39	2.4333	17 39 11.9	14.580	20	11 12 9.82	2.1913	4 28 9.0	17.554
21	9 24 10.20	2.4271	17 24 33.7	14.692	21	11 14 21.20	2.1881	4 10 35.4	17.565
22	9 26 35.64	2.4209	17 9 48.8	14.803	22	11 16 32.39	2.1848	3 53 1.2	17.573
23	9 29 0.71	2.4147	N.16 54 57.3	14.912	23	11 18 43.38	2.1816	N. 3 35 26.6	17.580
	MONDAY 26.					WEDNESDAY 28.			
0	9 31 25.41	2.4086	N.16 39 59.3	15.019	0	11 20 54.18	2.1785	N. 3 17 51.6	17.585
1	9 33 49.74	2.4025	16 24 55.0	15.123	1	11 23 4.80	2.1756	3 0 16.4	17.587
2	9 36 13.71	2.3964	16 9 44.5	15.225	2	11 25 15.25	2.1727	2 42 41.1	17.589
3	9 38 37.31	2.3903	15 54 28.0	15.325	3	11 27 25.53	2.1699	2 25 5.7	17.588
4	9 41 0.55	2.3843	15 39 5.5	15.423	4	11 29 35.64	2.1672	2 7 30.5	17.585
5	9 43 23.43	2.3784	15 23 37.2	15.518	5	11 31 45.59	2.1646	1 49 55.5	17.580
6	9 45 45.96	2.3725	15 8 3.3	15.612	6	11 33 55.39	2.1620	1 32 20.9	17.573
7	9 48 8.13	2.3666	14 52 23.8	15.703	7	11 36 5.03	2.1594	1 14 46.7	17.565
8	9 50 29.95	2.3607	14 36 38.9	15.792	8	11 38 14.52	2.1570	0 57 13.1	17.555
9	9 52 51.42	2.3549	14 20 48.8	15.878	9	11 40 23.87	2.1547	0 39 40.1	17.543
10	9 55 12.54	2.3491	14 4 53.5	15.963	10	11 42 33.09	2.1526	0 22 7.9	17.529
11	9 57 33.31	2.3433	13 48 53.2	16.046	11	11 44 42.18	2.1504	N. 0 4 36.6	17.514
12	9 59 53.74	2.3377	13 32 48.0	16.126	12	11 46 51.14	2.1483	S. 0 12 53.8	17.497
13	10 2 13.83	2.3321	13 16 38.1	16.203	13	11 48 59.98	2.1463	0 30 23.1	17.477
14	10 4 33.59	2.3266	13 0 23.6	16.279	14	11 51 8.70	2.1444	0 47 51.1	17.456
15	10 6 53.02	2.3211	12 44 4.6	16.352	15	11 53 17.31	2.1426	1 5 17.8	17.433
16	10 9 12.12	2.3156	12 27 41.3	16.423	16	11 55 25.81	2.1408	1 22 43.1	17.409
17	10 11 30.89	2.3103	12 11 13.8	16.493	17	11 57 34.21	2.1392	1 40 6.9	17.383
18	10 13 49.35	2.3050	11 54 42.1	16.561	18	11 59 42.52	2.1377	1 57 29.1	17.356
19	10 16 7.49	2.2997	11 38 6.5	16.625	19	12 1 50.73	2.1361	2 14 49.6	17.326
20	10 18 25.31	2.2944	11 21 27.1	16.687	20	12 3 58.85	2.1347	2 32 8.2	17.294
21	10 20 42.82	2.2892	11 4 44.0	16.747	21	12 6 6.89	2.1334	2 49 24.9	17.263
22	10 23 0.02	2.2842	10 47 57.4	16.806	22	12 8 14.86	2.1322	3 6 39.6	17.228
23	10 25 16.92	2.2793	10 31 7.3	16.862	23	12 10 22.76	2.1311	3 23 52.2	17.192
24	10 27 33.53	2.2744	N.10 14 13.9	16.916	24	12 12 30.59	2.1300	S. 3 41 2.6	17.154

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, ...	4	16	59.8
● New Moon, ...	12	20	58.8
☽ First Quarter, ...	20	16	15.6
○ Full Moon, ...	27	7	14.2

	d	h
☾ Apogee, ...	10	16.2
☾ Perigee, ...	26	1.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P.L of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
1	Pollux	W.	65° 17′ 18″	2233	67° 4′ 56″	2251	68° 52′ 7″	2269	70° 38′ 52″	2287
	Regulus	W.	28 22 32	2229	30 10 17	2247	31 57 35	2265	33 44 26	2283
	Spica	E.	25 40 55	2235	23 53 20	2254	22 6 13	2274	20 19 35	2294
	Antares	E.	71 32 58	2228	69 45 12	2246	67 57 33	2264	66 11 0	2283
	Mars	E.	75 13 23	2453	73 31 3	2472	71 49 10	2491	70 7 44	2510
	Jupiter	E.	88 59 43	2304	87 13 50	2323	85 28 24	2341	83 43 24	2360
	Venus	E.	112 48 38	2635	111 10 30	2654	109 32 48	2673	107 55 32	2692
	Sun	E.	136 20 35	2554	134 40 37	2572	133 1 4	2591	131 21 57	2611
2	Pollux	W.	79 25 52	2381	81 9 54	2400	82 53 29	2419	84 36 37	2438
	Regulus	W.	42 31 58	2377	44 16 6	2396	45 59 47	2415	47 43 1	2434
	Antares	E.	57 23 26	2377	55 39 18	2396	53 55 37	2415	52 12 23	2434
	Mars	E.	61 47 30	2612	60 8 52	2633	58 30 42	2655	56 53 1	2676
	Jupiter	E.	75 5 16	2456	73 23 1	2476	71 41 14	2496	69 59 55	2515
	Venus	E.	99 55 51	2794	98 21 15	2815	96 47 7	2836	95 13 26	2857
	α Aquilæ	E.	108 13 8	3214	106 47 15	3218	105 21 27	3223	103 55 45	3231
	Sun	E.	123 13 2	2710	121 36 35	2731	120 0 36	2751	118 25 4	2772
3	Pollux	W.	93 5 28	2534	94 45 54	2553	96 25 54	2571	98 5 29	2590
	Regulus	W.	56 12 22	2530	57 52 54	2548	59 33 0	2566	61 12 41	2585
	Antares	E.	43 43 2	2530	42 2 30	2548	40 22 24	2567	38 42 44	2585
	Mars	E.	48 51 44	2783	47 16 54	2805	45 42 32	2826	44 8 38	2848
	Jupiter	E.	61 40 13	2615	60 1 39	2635	58 23 31	2655	56 45 51	2675
	Venus	E.	87 31 42	2961	86 0 40	2981	84 30 4	3002	82 59 54	3022
	α Aquilæ	E.	96 49 56	3286	95 25 28	3301	94 1 18	3317	92 37 26	3332
	Sun	E.	110 34 6	2874	109 1 14	2894	107 28 47	2914	105 56 46	2933
4	Pollux	W.	106 17 9	2679	107 54 17	2695	109 31 3	2713	111 7 26	2729
	Regulus	W.	69 24 52	2674	71 2 7	2691	72 38 59	2708	74 15 28	2724
	Spica	W.	15 27 47	2690	17 4 40	2705	18 41 13	2719	20 17 27	2735
	Antares	E.	30 30 37	2675	28 53 24	2692	27 16 33	2709	25 40 5	2725
	Mars	E.	36 26 9	2958	34 55 3	2981	33 24 26	3003	31 54 17	3027
	Jupiter	E.	48 44 2	2772	47 8 57	2791	45 34 17	2810	44 0 2	2829
	Venus	E.	75 35 13	3120	74 7 28	3139	72 40 6	3158	71 13 6	3176
	α Aquilæ	E.	85 43 7	3428	84 21 22	3449	83 0 1	3471	81 39 4	3494
	Sun	E.	98 22 48	3030	96 53 12	3047	95 23 58	3066	93 55 7	3084
5	Regulus	W.	82 12 39	2801	83 47 5	2816	85 21 12	2830	86 55 1	2843
	Spica	W.	28 13 45	2807	29 48 4	2821	31 22 5	2835	32 55 48	2847
	Mars	E.	24 31 5	3158	23 4 5	3188	21 37 42	3223	20 12 0	3261
	Jupiter	E.	36 14 54	2924	34 43 5	2943	33 11 41	2963	31 40 42	2982
	Venus	E.	64 3 24	3261	62 38 27	3277	61 13 49	3293	59 49 29	3309
	α Aquilæ	E.	75 0 57	3620	73 42 44	3647	72 25 0	3676	71 7 47	3705
	Sun	E.	86 36 7	3168	85 9 19	3183	83 42 49	3198	82 16 37	3213
6	Regulus	W.	94 39 53	2905	96 12 5	2917	97 44 2	2928	99 15 45	2938
	Spica	W.	40 40 19	2909	42 12 27	2920	43 44 21	2931	45 16 1	2940
	Jupiter	E.	24 12 21	3098	22 44 9	3126	21 16 31	3158	19 49 32	3196
	Venus	E.	52 52 8	3379	51 29 27	3392	50 7 1	3404	48 44 49	3415
	α Aquilæ	E.	64 49 54	3871	63 36 5	3909	62 22 54	3948	61 10 23	3989
	Sun	E.	75 9 51	3280	73 45 16	3293	72 20 56	3304	70 56 49	3316
7	Regulus	W.	106 51 15	2985	108 21 47	2993	109 52 9	3001	111 22 21	3007

GREENWICH MEAN TIME.

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	72 25 10	2306	74 11 1	2324	75 56 25	2343	77 41 22	2362
	Regulus	W.	35 30 51	2301	37 16 49	2320	39 2 19	2339	40 47 22	2357
	Spica	E.	18 33 26	2315	16 47 48	2337	15 2 42	2360	13 18 10	2387
	Antares	E.	64 24 35	2301	62 38 37	2320	60 53 6	2338	59 8 2	2357
	Mars	E.	68 26 45	2530	66 46 14	2551	65 6 11	2571	63 26 36	2592
	Jupiter	E.	81 58 52	2379	80 14 47	2398	78 31 9	2417	76 47 59	2436
	Venus	E.	106 18 42	2713	104 42 19	2733	103 6 23	2753	101 30 54	2773
	Sun	E.	129 43 17	2630	128 5 3	2650	126 27 16	2670	124 49 56	2689
2	Pollux	W.	86 19 17	2458	88 1 30	2477	89 43 16	2496	91 24 35	2515
	Regulus	W.	49 25 47	2453	51 8 6	2472	52 49 58	2492	54 31 23	2510
	Antares	E.	50 29 37	2453	48 47 18	2472	47 5 26	2492	45 24 1	2510
	Mars	E.	55 15 49	2697	53 39 5	2719	52 2 50	2740	50 27 3	2761
	Jupiter	E.	68 19 3	2535	66 38 39	2556	64 58 43	2575	63 19 14	2596
	Venus	E.	93 40 12	2878	92 7 25	2898	90 35 4	2920	89 3 10	2940
	α Aquilæ	E.	102 30 12	3239	101 4 49	3249	99 39 38	3260	98 14 40	3272
	Sun	E.	116 49 59	2793	115 15 21	2812	113 41 9	2833	112 7 24	2854
3	Pollux	W.	99 44 38	2608	101 23 22	2626	103 1 42	2644	104 39 37	2661
	Regulus	W.	62 51 56	2604	64 30 46	2621	66 9 12	2639	67 47 14	2657
	Antares	E.	37 3 29	2604	35 24 39	2622	33 46 14	2640	32 8 14	2657
	Mars	E.	42 35 12	2870	41 2 15	2891	39 29 45	2913	37 57 43	2935
	Jupiter	E.	55 8 37	2695	53 31 50	2713	51 55 28	2733	50 19 32	2753
	Venus	E.	81 30 9	3043	80 0 49	3062	78 31 53	3082	77 3 21	3101
	α Aquilæ	E.	91 13 52	3350	89 50 38	3369	88 27 46	3387	87 5 15	3408
	Sun	E.	104 25 9	2953	102 53 57	2973	101 23 10	2992	99 52 47	3011
4	Pollux	W.	112 43 27	2746	114 19 6	2762	115 54 24	2778	117 29 21	2792
	Regulus	W.	75 51 36	2741	77 27 22	2756	79 2 48	2772	80 37 53	2786
	Spica	W.	21 53 21	2749	23 28 56	2764	25 4 11	2779	26 39 7	2793
	Antares	E.	24 3 59	2742	22 28 15	2758	20 52 52	2774	19 17 50	2789
	Mars	E.	30 24 38	3051	28 55 28	3075	27 26 48	3101	25 58 40	3129
	Jupiter	E.	42 26 12	2848	40 52 46	2866	39 19 44	2886	37 47 7	2905
	Venus	E.	69 46 28	3193	68 20 11	3211	66 54 15	3229	65 28 40	3245
	α Aquilæ	E.	80 18 33	3517	78 58 28	3542	77 38 50	3566	76 19 39	3593
	Sun	E.	92 26 38	3101	90 58 30	3118	89 30 42	3135	88 3 15	3151
5	Regulus	W.	88 28 33	2857	90 1 47	2869	91 34 45	2882	93 7 27	2894
	Spica	W.	34 29 15	2860	36 2 25	2873	37 35 18	2885	39 7 56	2897
	Mars	E.	18 47 3	3306	17 22 58	3357	15 59 52	3419	14 37 57	3496
	Jupiter	E.	30 10 8	3004	28 40 0	3025	27 10 18	3048	25 41 5	3072
	Venus	E.	58 25 28	3324	57 1 44	3338	55 38 16	3351	54 15 4	3365
	α Aquilæ	E.	69 51 5	3736	68 34 56	3768	67 19 21	3801	66 4 20	3835
	Sun	E.	80 50 43	3227	79 25 6	3241	77 59 45	3254	76 34 40	3266
6	Regulus	W.	100 47 16	2948	102 18 34	2958	103 49 39	2967	105 20 33	2977
	Spica	W.	46 47 29	2950	48 18 44	2961	49 49 46	2969	51 20 37	2977
	Jupiter	E.	18 23 18	3239	16 57 55	3290	15 33 32	3354	14 10 23	3439
	Venus	E.	47 22 50	3427	46 1 4	3438	44 39 31	3449	43 18 10	3460
	α Aquilæ	E.	59 58 33	4032	58 47 25	4078	57 37 2	4126	56 27 25	4177
	Sun	E.	69 32 56	3327	68 9 16	3337	66 45 47	3347	65 22 30	3357
7	Regulus	W.	112 52 25	3014	114 22 20	3020	115 52 6	3027	117 21 45	3033

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
7	Spica	W.	52° 51′ 18″	2986	54° 21′ 48″	2994	55° 52′ 8″	3002	57° 22′ 18″	3009
	Venus	E.	41 57 1	3470	40 36 3	3479	39 15 15	3488	37 54 38	3497
	α Aquilæ	E.	55 18 37	4230	54 10 39	4287	53 3 34	4347	51 57 25	4412
	Sun	E.	63 59 24	3365	62 36 28	3375	61 13 43	3383	59 51 7	3392
8	Spica	W.	64 51 5	3040	66 20 28	3044	67 49 46	3049	69 18 58	3053
	Antares	W.	18 57 9	3040	20 26 32	3046	21 55 48	3050	23 24 59	3054
	Mars	W.	12 0 58	3735	13 17 8	3656	14 34 42	3598	15 53 19	3554
	Venus	E.	31 13 54	3537	29 54 11	3545	28 34 36	3552	27 15 9	3558
	α Aquilæ	E.	46 42 26	4814	45 43 1	4913	44 44 57	5022	43 48 19	5141
	Sun	E.	53 0 15	3425	51 38 26	3431	50 16 44	3435	48 55 7	3440
9	Spica	W.	76 43 47	3070	78 12 33	3072	79 41 17	3074	81 9 58	3076
	Antares	W.	30 49 47	3069	32 18 34	3072	33 47 18	3073	35 16 0	3076
	Mars	W.	22 35 18	3445	23 56 44	3434	25 18 22	3424	26 40 11	3417
	Sun	E.	42 8 17	3459	40 47 7	3461	39 25 59	3463	38 4 54	3466
10	Spica	W.	88 32 58	3081	90 1 31	3081	91 30 4	3081	92 58 37	3080
	Antares	W.	42 39 3	3080	44 7 37	3080	45 36 11	3080	47 4 45	3079
	Mars	W.	33 31 5	3390	34 53 33	3386	36 16 5	3382	37 38 42	3379
	Jupiter	W.	24 9 50	3259	25 34 50	3247	27 0 4	3236	28 25 30	3228
	Sun	E.	31 19 59	3472	29 59 4	3472	28 38 9	3473	27 17 15	3473
11	Spica	W.	100 21 35	3076	101 50 14	3073	103 18 56	3072	104 47 40	3070
	Antares	W.	54 27 48	3074	55 56 29	3073	57 25 12	3071	58 53 57	3069
	Jupiter	W.	35 34 55	3195	37 1 10	3189	38 27 32	3184	39 54 0	3179
15	Sun	W.	23 21 50	3329	24 45 28	3321	26 9 15	3314	27 33 10	3306
	α Arietis	E.	46 15 17	2989	44 44 50	2985	43 14 18	2980	41 43 40	2977
	Aldebaran	E.	77 54 0	3028	76 24 22	3022	74 54 37	3018	73 24 46	3013
16	Sun	W.	34 35 4	3266	35 59 55	3257	37 24 57	3248	38 50 9	3240
	α Arietis	E.	34 9 29	2962	32 38 29	2961	31 7 27	2961	29 36 25	2961
	Aldebaran	E.	65 53 56	2987	64 23 27	2981	62 52 51	2977	61 22 9	2972
	Pollux	E.	108 37 14	2898	107 4 53	2891	105 32 22	2883	103 59 41	2875
17	Sun	W.	45 58 48	3193	47 25 6	3183	48 51 35	3173	50 18 17	3163
	α Pegasi	W.	27 55 51	4059	29 6 33	3934	30 19 18	3824	31 35 55	3727
	Aldebaran	E.	53 47 10	2950	52 15 54	2946	50 44 33	2942	49 13 8	2939
	Pollux	E.	96 13 39	2832	94 39 53	2824	93 5 56	2814	91 31 46	2805
18	Sun	W.	57 34 59	3107	59 3 0	3096	60 31 15	3083	61 59 45	3071
	α Pegasi	W.	38 9 26	3377	39 32 9	3325	40 55 52	3277	42 20 30	3233
	Aldebaran	E.	41 35 20	2935	40 3 45	2936	38 32 12	2939	37 0 43	2945
	Pollux	E.	83 37 47	2755	82 2 19	2744	80 26 37	2732	78 50 40	2722
19	Sun	W.	69 26 6	3006	70 56 11	2993	72 26 32	2980	73 57 10	2965
	α Pegasi	W.	49 35 37	3053	51 4 44	3022	52 34 29	2994	54 4 49	2966
	Aldebaran	E.	29 26 1	3014	27 56 6	3042	26 26 45	3078	24 58 8	3124
	Pollux	E.	70 47 10	2663	69 9 40	2651	67 31 54	2638	65 53 51	2625
	Regulus	E.	107 39 29	2657	106 1 52	2646	104 23 59	2633	102 45 49	2620
20	Sun	W.	81 34 53	2893	83 7 21	2877	84 40 9	2862	86 13 17	2847

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
7	Spica	W.	58° 52′ 20″	3016	60° 22′ 13″	3022	61° 51′ 58″	3029	63° 21′ 35″	3034
	Venus	E.	36 34 11	3506	35 13 53	3515	33 53 45	3522	32 33 45	3530
	α Aquilæ	E.	50 52 15	4481	49 48 6	4556	48 45 3	4636	47 43 8	4721
	Sun	E.	58 28 41	3399	57 6 23	3406	55 44 13	3412	54 22 10	3419
8	Spica	W.	70 48 5	3057	72 17 7	3061	73 46 4	3065	75 14 57	3067
	Antares	W.	24 54 5	3057	26 23 7	3061	27 52 4	3065	29 20 57	3067
	Mars	W.	17 12 44	3521	18 32 45	3495	19 53 15	3475	21 14 7	3458
	Venus	E.	25 55 49	3565	24 36 37	3573	23 17 33	3580	21 58 37	3589
	α Aquilæ	E.	42 53 13	5269	41 59 43	5411	41 7 56	5564	40 17 57	5734
	Sun	E.	47 33 36	3445	46 12 10	3448	44 50 48	3452	43 29 30	3456
9	Spica	W.	82 38 37	3078	84 7 14	3078	85 35 50	3080	87 4 24	3080
	Antares	W.	36 44 39	3077	38 13 17	3078	39 41 53	3079	41 10 28	3079
	Mars	W.	28 2 8	3410	29 24 13	3404	30 46 25	3400	32 8 42	3394
	Sun	E.	36 43 52	3468	35 22 52	3469	34 1 53	3470	32 40 55	3471
10	Spica	W.	94 27 11	3079	95 55 46	3079	97 24 21	3078	98 52 57	3077
	Antares	W.	48 33 20	3078	50 1 56	3078	51 30 32	3078	52 59 9	3076
	Mars	W.	39 1 23	3375	40 24 8	3371	41 46 58	3367	43 9 52	3365
	Jupiter	W.	29 51 6	3920	31 16 51	3913	32 42 45	3907	34 8 46	3900
	Sun	E.	25 56 21	3473	24 35 27	3473	23 14 33	3473	21 53 39	3472
11	Spica	W.	106 16 26	3068	107 45 15	3066	109 14 6	3063	110 43 1	3060
	Antares	W.	60 22 44	3067	61 51 34	3065	63 20 27	3062	64 49 23	3059
	Jupiter	W.	41 20 34	3174	42 47 14	3169	44 14 0	3164	45 40 52	3159
15	Sun	W.	28 57 14	3999	30 21 27	3990	31 45 50	3982	33 10 22	3974
	α Arietis	E.	40 12 58	2973	38 42 12	2969	37 11 21	2967	35 40 27	2964
	Aldebaran	E.	71 54 49	3007	70 24 45	3002	68 54 35	2997	67 24 19	2992
16	Sun	W.	40 15 31	3931	41 41 4	3922	43 6 47	3912	44 32 42	3903
	α Arietis	E.	28 5 23	2962	26 34 23	2965	25 3 27	2970	23 32 37	2979
	Aldebaran	E.	59 51 21	2967	58 20 27	2962	56 49 27	2958	55 18 21	2954
	Pollux	E.	102 26 50	2866	100 53 48	2859	99 20 36	2850	97 47 13	2842
17	Sun	W.	51 45 11	3152	53 12 18	3141	54 39 38	3129	56 7 12	3119
	α Pegasi	W.	32 50 14	3640	34 8 5	3565	35 27 18	3496	36 47 47	3433
	Aldebaran	E.	47 41 39	2937	46 10 7	2935	44 38 32	2934	43 6 56	2934
	Pollux	E.	89 57 24	2795	88 22 49	2785	86 48 2	2775	85 13 1	2765
18	Sun	W.	63 28 30	3059	64 57 30	3046	66 26 46	3033	67 56 18	3020
	α Pegasi	W.	43 46 0	3193	45 12 18	3154	46 39 22	3119	48 7 9	3085
	Aldebaran	E.	35 29 21	2952	33 58 8	2962	32 27 8	2975	30 56 24	2992
	Pollux	E.	77 14 29	2710	75 38 3	2698	74 1 21	2687	72 24 24	2675
19	Sun	W.	75 28 6	2951	76 59 20	2937	78 30 52	2922	80 2 43	2907
	α Pegasi	W.	55 35 44	2940	57 7 12	2915	58 39 12	2890	60 11 44	2866
	Aldebaran	E.	23 30 27	3182	22 3 56	3257	20 38 54	3354	19 15 45	3480
	Pollux	E.	64 15 30	2612	62 36 52	2599	60 57 56	2586	59 18 42	2573
	Regulus	E.	101 7 21	2607	99 28 36	2593	97 49 32	2580	96 10 10	2566
20	Sun	W.	87 46 44	2831	89 20 31	2815	90 54 39	2800	92 29 7	2784

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	α Pegasi	W.	61° 44′ 46″	2843	63° 18′ 18″	2821	64° 52′ 18″	2799	66° 26′ 47″	2778
	α Arietis	W.	18 8 9	2759	19 43 31	2715	21 19 51	2675	22 57 4	2641
	Pollux	E.	57 39 9	2559	55 59 18	2545	54 19 8	2532	52 38 39	2518
	Regulus	E.	94 30 29	2553	92 50 29	2539	91 10 10	2525	89 29 31	2511
21	Sun	W.	94 3 56	2768	95 39 6	2752	97 14 37	2736	98 50 29	2719
	α Arietis	W.	31 13 17	2512	32 54 14	2491	34 35 40	2470	36 17 35	2450
	Pollux	E.	44 11 22	2448	42 28 55	2433	40 46 8	2419	39 3 1	2405
	Regulus	E.	81 1 16	2438	79 18 35	2423	77 35 33	2408	75 52 10	2394
22	Sun	W.	106 55 14	2639	108 33 16	2624	110 11 39	2607	111 50 24	2592
	α Arietis	W.	44 53 57	2359	46 38 31	2342	48 23 29	2325	50 8 52	2309
	Pollux	E.	30 22 26	2338	28 37 22	2325	26 51 59	2314	25 6 20	2303
	Regulus	E.	67 9 53	2319	65 24 21	2304	63 38 27	2289	61 52 12	2275
	Spica	E.	121 9 56	2320	119 24 26	2306	117 38 35	2291	115 52 22	2277
23	Sun	W.	120 9 24	2517	121 50 14	2502	123 31 24	2489	125 12 53	2475
	α Arietis	W.	59 1 33	2233	69 49 12	2218	62 37 13	2204	64 25 34	2191
	Aldebaran	W.	29 4 30	2533	30 44 57	2487	32 26 29	2445	34 8 59	2409
	Regulus	E.	52 55 41	2205	51 7 21	2192	49 18 42	2179	47 29 43	2167
	Spica	E.	106 56 0	2206	105 7 41	2193	103 19 3	2180	101 30 5	2168
24	Sun	W.	133 44 58	2412	135 28 15	2402	137 11 47	2391	138 55 34	2382
	α Arietis	W.	73 32 9	2131	75 22 21	2120	77 12 50	2110	79 3 34	2101
	Aldebaran	W.	42 52 59	2272	44 39 39	2252	46 26 49	2233	48 14 28	2216
	Regulus	E.	38 20 12	2109	36 29 27	2099	34 38 26	2089	32 47 10	2080
	Spica	E.	92 20 41	2109	90 29 56	2099	88 38 56	2090	86 47 41	2081
25	α Arietis	W.	88 20 34	2062	90 12 32	2056	92 4 39	2052	93 56 53	2047
	Aldebaran	W.	57 18 29	2149	59 8 14	2139	60 58 14	2130	62 48 27	2122
	Pollux	W.	13 42 7	2115	15 32 43	2096	17 23 49	2079	19 15 20	2066
	Spica	E.	77 28 10	2042	75 35 42	2037	73 43 6	2032	71 50 22	2028
	Antares	E.	123 21 58	2042	121 29 29	2036	119 36 51	2031	117 44 5	2026
26	Aldebaran	W.	72 1 59	2099	73 53 0	2097	75 44 4	2096	77 35 9	2096
	Pollux	W.	28 36 42	2033	30 29 24	2032	32 22 9	2030	34 14 56	2030
	Spica	E.	62 25 20	2016	60 32 11	2016	58 39 2	2017	56 45 54	2018
	Antares	E.	108 18 53	2015	106 25 42	2014	104 32 30	2015	102 39 19	2016
27	Aldebaran	W.	86 50 5	2110	88 40 49	2116	90 31 24	2122	92 21 49	2129
	Pollux	W.	43 38 26	2043	45 30 53	2048	47 23 13	2053	49 15 24	2060
	Spica	E.	47 21 7	2035	45 28 28	2042	43 35 59	2048	41 43 40	2055
	Antares	E.	93 14 18	2033	91 21 36	2039	89 29 3	2045	87 36 39	2052
	Mars	E.	113 47 27	2245	112 0 7	2251	110 12 55	2257	108 25 52	2264
	Jupiter	E.	114 53 7	2098	113 2 4	2103	111 11 9	2109	109 20 23	2115
28	Aldebaran	W.	101 30 45	2178	103 19 45	2190	105 8 27	2204	106 56 49	2218
	Pollux	W.	58 33 24	2104	60 24 17	2115	62 14 54	2126	64 5 14	2138
	Regulus	W.	21 37 59	2099	23 28 59	2111	25 19 42	2122	27 10 8	2134
	Spica	E.	32 25 15	2103	30 34 20	2115	28 43 43	2127	26 53 25	2139
	Antares	E.	78 17 46	2098	76 26 43	2109	74 35 58	2121	72 45 31	2133
	Mars	E.	99 33 35	2310	97 47 50	2322	96 2 22	2333	94 17 11	2346
	Jupiter	E.	100 9 22	2159	98 19 52	2169	96 30 38	2181	94 41 42	2193

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
20	α Pegasi	W	68° 1′ 44″	2757	69° 37′ 8″	2737	71° 12′ 59″	2718	72° 49′ 15″	2698
	α Arietis	W.	24 35 3	2611	26 13 43	2584	27 53 0	2559	29 32 52	2535
	Pollux	E.	50 57 51	2504	49 16 43	2490	47 35 16	2476	45 53 29	2462
	Regulus	E.	87 48 33	2496	86 7 14	2482	84 25 35	2467	82 43 36	2453
21	Sun	W.	100 26 43	2704	102 3 18	2687	103 40 15	2671	105 17 34	2655
	α Arietis	W.	37 59 58	2431	39 42 48	2412	41 26 5	2394	43 9 48	2376
	Pollux	E.	37 19 33	2391	35 35 45	2378	33 51 38	2364	32 7 11	2351
	Regulus	E.	74 8 26	2378	72 24 20	2364	70 39 53	2348	68 55 4	2333
22	Sun	W.	113 29 30	2577	115 8 57	2561	116 48 45	2546	118 28 54	2531
	α Arietis	W.	51 54 38	2293	53 40 48	2278	55 27 20	2262	57 14 15	2247
	Pollux	E.	23 20 25	2293	21 34 15	2285	19 47 53	2277	18 1 20	2272
	Regulus	E.	60 5 36	2261	58 18 39	2246	56 31 20	2233	54 43 41	2218
	Spica	E.	114 5 48	2262	112 18 53	2248	110 31 36	2233	108 43 58	2220
23	Sun	W.	126 54 42	2462	128 36 49	2448	130 19 15	2436	132 1 58	2424
	α Arietis	W.	66 14 15	2178	68 3 16	2165	69 52 36	2153	71 42 14	2142
	Aldebaran	W.	35 52 21	2376	37 36 30	2347	39 21 21	2320	41 6 52	2295
	Regulus	E.	45 40 25	2155	43 50 49	2142	42 0 54	2130	40 10 41	2120
	Spica	E.	99 40 49	2155	97 51 14	2143	96 1 20	2132	94 11 9	2120
24	Sun	W.	140 39 35	2379	142 23 50	2364	144 8 17	2355	145 52 56	2348
	α Arietis	W.	80 54 32	2092	82 45 44	2083	84 37 9	2075	86 28 46	2068
	Aldebaran	W.	50 2 32	2200	51 51 0	2185	53 39 50	2172	55 29 0	2159
	Regulus	E.	30 55 40	2072	29 3 57	2064	27 12 2	2056	25 19 55	2050
	Spica	E.	84 56 12	2072	83 4 29	2064	81 12 34	2057	79 20 28	2049
25	α Arietis	W.	95 49 14	2043	97 41 41	2041	99 34 12	2039	101 26 46	2037
	Aldebaran	W.	64 38 52	2116	66 29 27	2110	68 20 11	2105	70 11 2	2101
	Pollux	W.	21 7 11	2056	22 59 18	2048	24 51 37	2042	26 44 6	2037
	Spica	E.	69 57 31	2024	68 4 34	2021	66 11 33	2019	64 18 28	2017
	Antares	E.	115 51 12	2023	113 58 13	2020	112 5 10	2017	110 12 3	2016
26	Aldebaran	W.	79 26 14	2098	81 17 17	2099	83 8 17	2101	84 59 14	2105
	Pollux	W.	36 7 43	2031	38 0 29	2033	39 53 12	2035	41 45 52	2039
	Spica	E.	54 52 48	2020	52 59 45	2023	51 6 46	2026	49 13 53	2031
	Antares	E.	100 46 10	2019	98 53 5	2021	97 0 4	2025	95 7 8	2028
27	Aldebaran	W.	94 12 4	2137	96 2 6	2147	97 51 54	2157	99 41 27	2167
	Pollux	W.	51 7 25	2068	52 59 14	2075	54 50 51	2084	56 42 15	2094
	Spica	E.	39 51 32	2063	37 59 36	2072	36 7 54	2082	34 16 27	2092
	Antares	E.	85 44 26	2060	83 52 25	2068	82 0 37	2078	80 9 4	2088
	Mars	E.	106 39 0	2272	104 52 19	2280	103 5 50	2289	101 19 35	2300
	Jupiter	E.	107 29 46	2122	105 39 20	2130	103 49 7	2139	101 59 7	2149
28	Aldebaran	W.	108 44 50	2233	110 32 29	2247	112 19 46	2264	114 6 39	2281
	Pollux	W.	65 55 15	2151	67 44 57	2164	69 34 19	2178	71 23 20	2192
	Regulus	W.	29 0 16	2147	30 50 4	2159	32 39 33	2173	34 28 41	2187
	Spica	E.	25 3 26	2154	23 13 49	2169	21 24 34	2184	19 35 42	2200
	Antares	E.	70 55 22	2146	69 5 33	2159	67 16 3	2172	65 26 54	2187
	Mars	E.	92 32 18	2359	90 47 44	2373	89 3 31	2387	87 19 38	2403
	Jupiter	E.	92 53 4	2206	91 4 45	2219	89 16 46	2233	87 29 7	2247

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be added to Apparent Time.*	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	22 50 6.97	9.349	S. 7 25 21.3	+57.06	16 10.30	65.40	12 30.42	0.506
Frid.	2	22 53 51.09	9.329	7 2 28.6	57.32	16 10.05	65.33	12 18.02	0.526
Sat.	3	22 57 34.74	9.310	6 39 29.8	57.56	16 9.80	65.26	12 5.13	0.545
Sun.	4	23 1 17.92	9.292	6 16 25.4	57.79	16 9.55	65.19	11 51.79	0.563
Mon.	5	23 5 0.67	9.274	5 53 15.8	58.00	16 9.29	65.13	11 38.03	0.581
Tues.	6	23 8 43.01	9.256	5 30 1.3	58.20	16 9.03	65.07	11 23.85	0.598
Wed.	7	23 12 24.94	9.240	5 6 42.2	58.38	16 8.77	65.01	11 9.27	0.614
Thur.	8	23 16 6.51	9.225	4 43 19.0	58.54	16 8.51	64.95	10 54.33	0.629
Frid.	9	23 19 47.73	9.210	4 19 52.0	58.69	16 8.24	64.90	10 39.05	0.644
Sat.	10	23 23 28.63	9.197	3 56 21.6	58.83	16 7.97	64.85	10 23.43	0.657
Sun.	11	23 27 9.21	9.184	3 32 48.1	58.95	16 7.70	64.80	10 7.50	0.670
Mon.	12	23 30 49.49	9.172	3 9 12.1	59.04	16 7.43	64.76	9 51.26	0.682
Tues.	13	23 34 29.48	9.161	2 45 34.0	59.12	16 7.16	64.72	9 34.74	0.693
Wed.	14	23 38 9.21	9.151	2 21 54.2	59.19	16 6.89	64.68	9 17.95	0.703
Thur.	15	23 41 48.69	9.141	1 58 13.0	59.24	16 6.62	64.64	9 0.93	0.713
Frid.	16	23 45 27.95	9.132	1 34 30.8	59.27	16 6.35	64.61	8 43.69	0.722
Sat.	17	23 49 6.99	9.123	1 10 48.0	59.29	16 6.08	64.58	8 26.23	0.731
Sun.	18	23 52 45.83	9.115	0 47 4.9	59.29	16 5.81	64.55	8 8.57	0.739
Mon.	19	23 56 24.48	9.107	S. 0 23 22.0	59.28	16 5.54	64.53	7 50.72	0.747
Tues.	20	0 0 2.99	9.101	N. 0 0 20.3	59.25	16 5.27	64.51	7 32.71	0.753
Wed.	21	0 3 41.37	9.096	0 24 1.6	59.20	16 5.00	64.50	7 14.58	0.758
Thur.	22	0 7 19.61	9.091	0 47 41.5	59.14	16 4.73	64.48	6 56.33	0.763
Frid.	23	0 10 57.76	9.087	1 11 19.7	59.06	16 4.46	64.47	6 37.98	0.767
Sat.	24	0 14 35.83	9.084	1 34 55.9	58.97	16 4.19	64.46	6 19.54	0.770
Sun.	25	0 18 13.83	9.082	1 58 29.7	58.86	16 3.92	64.46	6 1.04	0.772
Mon.	26	0 21 51.79	9.081	2 22 0.8	58.74	16 3.65	64.46	5 42.50	0.773
Tues.	27	0 25 29.75	9.081	2 45 29.0	58.61	16 3.37	64.46	5 23.95	0.773
Wed.	28	0 29 7.72	9.083	3 8 53.9	58.46	16 3.10	64.46	5 5.41	0.771
Thur.	29	0 32 45.73	9.085	3 32 15.2	58.30	16 2.82	64.47	4 46.91	0.769
Frid.	30	0 36 23.80	9.088	3 55 32.3	58.13	16 2.54	64.48	4 28.49	0.766
Sat.	31	0 40 1.94	9.092	4 18 45.2	57.94	16 2.26	64.50	4 10.13	0.762
Sun.	32	0 43 40.18	9.097	N. 4 41 53.4	+57.74	16 1.98	64.51	3 51.87	0.757

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^s.18$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Equation of Time, *to be subtracted from Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	22 50 5.02	9.350	S. 7 25 33.2	+57.07	12 30.52	0.506	22 37 34.50
Frid.	2	22 53 49.18	9.330	7 2 40.4	57.33	12 18.12	0.526	22 41 31.06
Sat.	3	22 57 32.85	9.311	6 39 41.4	57.57	12 5.24	0.545	22 45 27.61
Sun.	4	23 1 16.07	9.293	6 16 36.9	57.80	11 51.90	0.563	22 49 24.17
Mon.	5	23 4 58.86	9.275	5 53 27.1	58.01	11 38.14	0.581	22 53 20.72
Tues.	6	23 8 41.24	9.258	5 30 12.4	58.21	11 23.96	0.508	22 57 17.28
Wed.	7	23 12 23.21	9.242	5 6 53.1	58.39	11 9.38	0.614	23 1 13.83
Thur.	8	23 16 4.82	9.227	4 43 29.7	58.55	10 54.44	0.629	23 5 10.38
Frid.	9	23 19 46.09	9.212	4 20 2.4	58.70	10 39.16	0.644	23 9 6.93
Sat.	10	23 23 27.03	9.199	3 56 31.8	58.84	10 23.54	0.657	23 13 3.49
Sun.	11	23 27 7.65	9.186	3 32 58.1	58.96	10 7.61	0.670	23 17 0.04
Mon.	12	23 30 47.97	9.174	3 9 21.9	59.05	9 51.37	0.682	23 20 56.60
Tues.	13	23 34 28.10	9.163	2 45 43.5	59.13	9 34.85	0.693	23 24 53.15
Wed.	14	23 38 7.77	9.153	2 22 3.5	59.20	9 18.06	0.703	23 28 49.71
Thur.	15	23 41 47.30	9.143	1 58 21.9	59.25	9 1.04	0.713	23 32 46.26
Frid.	16	23 45 26.61	9.134	1 34 39.4	59.28	8 43.80	0.722	23 36 42.81
Sat.	17	23 49 5.70	9.125	1 10 56.3	59.30	8 26.34	0.731	23 40 39.36
Sun.	18	23 52 44.59	9.117	0 47 13.0	59.30	8 8.67	0.739	23 44 35.92
Mon.	19	23 56 23.29	9.109	S. 0 23 29.8	59.29	7 50.82	0.747	23 48 32.47
Tues.	20	0 0 1.84	9.103	N. 0 0 12.8	59.26	7 32.81	0.753	23 52 29.03
Wed.	21	0 3 40.26	9.098	0 23 54.4	59.21	7 14.68	0.758	23 56 25.58
Thur.	22	0 7 18.55	9.093	0 47 34.6	59.15	6 56.42	0.763	0 0 22.13
Frid.	23	0 10 56.74	9.089	1 11 13.1	59.07	6 38.06	0.767	0 4 18.68
Sat.	24	0 14 34.86	9.086	1 34 49.6	58.98	6 19.62	0.770	0 8 15.24
Sun.	25	0 18 12.91	9.084	1 58 23.7	58.87	6 1.12	0.772	0 12 11.79
Mon.	26	0 21 50.92	9.083	2 21 55.2	58.75	5 42.57	0.773	0 16 8.35
Tues.	27	0 25 28.92	9.083	2 45 23.8	58.62	5 24.02	0.773	0 20 4.90
Wed.	28	0 29 6.93	9.085	3 8 48.9	58.47	5 5.48	0.771	0 24 1.46
Thur.	29	0 32 44.99	9.087	3 32 10.4	58.31	4 46.98	0.769	0 27 58.01
Frid.	30	0 36 23.11	9.090	3 55 27.9	58.14	4 28.55	0.766	0 31 54.56
Sat.	31	0 40 1.30	9.094	4 18 41.1	57.95	4 10.19	0.762	0 35 51.11
Sun.	32	0 43 39.58	9.099	N. 4 41 49.6	+57.75	3 51.92	0.757	0 39 47.67

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

Diff. for 1 hour.
$+9^{s}.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	341 3 36.2	3 21.6	150.32	−0.14	9.9962688	+46.1	1 22 12.00
2	61	342 3 43.0	3 28.3	150.25	0.27	.9963804	46.8	1 18 16.09
3	62	343 3 48.2	3 33.4	150.19	0.37	.9964936	47.4	1 14 20.18
4	63	344 3 51.9	3 36.9	150.12	0.46	.9966082	48.0	1 10 24.28
5	64	345 3 54.0	3 38.8	150.05	0.51	.9967220	48.5	1 6 28.36
6	65	346 3 54.3	3 39.1	149.98	0.55	.9968413	49.0	1 2 32.45
7	66	347 3 52.9	3 37.6	149.91	0.55	.9969594	49.4	0 58 36.54
8	67	348 3 49.9	3 34.5	149.84	0.50	.9970783	49.7	0 54 40.63
9	68	349 3 45.3	3 29.8	149.77	0.44	.9971979	49.9	0 50 44.73
10	69	350 3 39.0	3 23.4	149.70	0.34	.9973180	50.1	0 46 48.83
11	70	351 3 31.0	3 15.3	149.63	0.24	.9974385	50.3	0 42 52.92
12	71	352 3 21.2	3 5.4	149.55	−0.11	.9975594	50.4	0 38 57.01
13	72	253 3 9.6	2 53.6	149.47	+0.02	.9976804	50.4	0 35 1.10
14	73	354 2 56.0	2 39.9	149.39	0.16	.9978013	50.4	0 31 5.19
15	74	355 2 40.5	2 24.3	149.31	0.29	.9979222	50.4	0 27 9.28
16	75	356 2 23.0	2 6.7	149.23	0.42	.9980430	50.4	0 23 13.38
17	76	357 2 3.4	1 47.0	149.14	0.52	.9981638	50.3	0 19 17.47
18	77	358 1 41.5	1 25.0	149.05	0.61	.9982846	50.3	0 15 21.56
19	78	359 1 17.4	1 0.8	148.95	0.66	.9984054	50.4	0 11 25.65
20	79	0 0 51.0	0 34.3	148.85	0.69	.9985263	50.4	0 7 29.73
21	80	1 0 22.3	0 5.5	148.76	0.67	.9986473	50.5	0 3 33.84 23 59 37.93
22	81	1 59 51.3	59 34.4	148.66	0.61	.9987686	50.6	23 55 42.02
23	82	2 59 17.8	59 0.9	148.56	0.55	.9988903	50.8	23 51 46.11
24	83	3 58 42.1	58 25.0	148.46	0.45	.9990125	51.0	23 47 50.21
25	84	4 58 4.1	57 46.9	148.37	0.35	.9991352	51.2	23 43 54.30
26	85	5 57 23.9	57 6.5	148.27	0.28	.9992583	51.4	23 39 58.39
27	86	6 56 41.4	56 23.9	148.18	+0.10	.9993820	51.7	23 36 2.49
28	87	7 55 56.7	55 39.1	148.09	−0.04	.9995064	52.0	23 32 6.57
29	88	8 55 9.9	54 52.2	148.00	0.15	.9996315	52.2	23 28 10.66
30	89	9 54 21.0	54 3.2	147.92	0.26	.9997572	52.4	23 24 14.75
31	90	10 53 30.2	53 12.3	147.84	0.35	9.9998836	52.6	23 20 18.84
32	91	11 52 37.5	52 19.5	147.76	−0.41	0.0000105	+52.8	23 16 22.95

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^s.8296$

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 19.3	16 12.6	59 47.4	−1.94	59 22.9	−2.14	14 2.5	2.02	16.1
2	16 5.4	15 57.8	58 56.4	2.27	58 28.7	2.35	14 51.2	2.05	17.1
3	15 50.1	15 42.4	58 0.3	2.37	57 32.0	2.35	15 40.9	2.10	18.1
4	15 34.8	15 27.5	57 4.2	2.28	56 37.5	2.17	16 32.0	2.16	19.1
5	15 20.6	15 14.3	56 12.2	2.03	55 48.8	1.86	17 24.5	2.20	20.1
6	15 8.5	15 3.3	55 27.5	1.69	55 8.4	1.49	18 17.6	2.21	21.1
7	14 58.8	14 54.9	54 51.7	1.29	54 37.5	1.08	19 10.3	2.17	22.1
8	14 51.7	14 49.2	54 25.8	0.87	54 16.6	0.66	20 1.4	2.08	23.1
9	14 47.4	14 46.2	54 9.9	0.46	54 5.6	−0.27	20 50.1	1.97	24.1
10	14 45.6	14 45.6	54 3.5	−0.08	54 3.6	+0.09	21 36.2	1.86	25.1
11	14 46.2	14 47.3	54 5.6	+0.25	54 9.5	0.40	22 19.8	1.77	26.1
12	14 48.8	14 50.7	54 15.1	0.53	54 22.1	0.64	23 1.5	1.71	27.1
13	14 53.0	14 55.6	54 30.5	0.75	54 40.0	0.84	23 42.2	1.69	28.1
14	14 58.5	15 1.6	54 50.6	0.92	55 2.1	0.99	☌		29.1
15	15 4.9	15 8.4	55 14.3	1.04	55 27.1	1.09	0 22.8	1.70	0.4
16	15 12.0	15 15.8	55 40.5	1.14	55 54.4	1.18	1 4.3	1.76	1.4
17	15 19.7	15 23.7	56 8.8	1.21	56 23.5	1.24	1 47.8	1.88	2.4
18	15 27.9	15 32.0	56 38.6	1.27	56 54.0	1.30	2 34.5	2.03	3.4
19	15 36.3	15 40.7	57 9.8	1.33	57 25.8	1.34	3 25.4	2.22	4.4
20	15 45.1	15 49.5	57 42.0	1.36	57 58.4	1.37	4 20.7	2.40	5.4
21	15 54.0	15 58.5	58 14.9	1.37	58 31.3	1.36	5 20.0	2.54	6.4
22	16 3.0	16 7.3	58 47.5	1.34	59 3.3	1.28	6 21.6	2.58	7.4
23	16 11.3	16 15.0	59 18.2	1.20	59 32.0	1.10	7 23.0	2.52	8.4
24	16 18.5	16 21.3	59 44.4	0.96	59 55.0	0.79	8 22.1	2.39	9.4
25	16 23.6	16 25.1	60 3.3	0.59	60 9.0	+0.36	9 17.8	2.25	10.4
26	16 25.9	16 25.8	60 11.8	+0.10	60 11.4	−0.17	10 10.3	2.13	11.4
27	16 24.8	16 22.9	60 7.8	−0.45	60 0.7	0.73	11 0.3	2.05	12.4
28	16 20.0	16 16.3	59 50.3	1.00	59 36.7	1.26	11 49.2	2.03	13.4
29	16 11.9	16 6.7	59 20.2	1.49	59 1.1	1.69	12 38.0	2.05	14.4
30	16 0.9	15 54.6	58 39.8	1.85	58 16.9	1.96	13 27.9	2.11	15.4
31	15 48.0	15 41.4	57 52.9	2.03	57 28.4	2.06	14 19.4	2.18	16.4
32	15 34.7	15 28.0	57 3.7	−2.05	56 39.4	−1.99	15 12.6	2.25	17.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 12 30.59	2.1300	S. 3 41 2.6	17.154	0	13 54 50.80	2.1580	S. 16 13 11.3	13.683
1	12 14 38.36	2.1290	3 58 10.7	17.114	1	13 57 0.34	2.1599	16 26 49.2	13.581
2	12 16 46.07	2.1280	4 15 16.3	17.072	2	13 59 9.99	2.1618	16 40 21.0	13.478
3	12 18 53.72	2.1270	4 32 19.4	17.030	3	14 1 19.75	2.1637	16 53 46.6	13.374
4	12 21 1.31	2.1262	4 49 19.9	16.987	4	14 3 29.63	2.1657	17 7 5.9	13.269
5	12 23 8.86	2.1256	5 6 17.8	16.942	5	14 5 39.64	2.1678	17 20 18.9	13.162
6	12 25 16.38	2.1250	5 23 12.9	16.894	6	14 7 49.77	2.1698	17 33 25.4	13.055
7	12 27 23.86	2.1244	5 40 5.1	16.845	7	14 10 0.02	2.1719	17 46 25.5	12.947
8	12 29 31.31	2.1240	5 56 54.3	16.795	8	14 12 10.40	2.1741	17 59 19.1	12.839
9	12 31 38.74	2.1237	6 13 40.5	16.743	9	14 14 20.91	2.1762	18 12 6.2	12.730
10	12 33 46.15	2.1233	6 30 23.5	16.690	10	14 16 31.55	2.1784	18 24 46.7	12.618
11	12 35 53.53	2.1229	6 47 3.3	16.635	11	14 18 42.32	2.1807	18 37 20.4	12.506
12	12 38 0.90	2.1227	7 3 39.7	16.578	12	14 20 53.23	2.1829	18 49 47.4	12.393
13	12 40 8.26	2.1227	7 20 12.7	16.521	13	14 23 4.27	2.1852	19 2 7.6	12.280
14	12 42 15.62	2.1227	7 36 42.2	16.462	14	14 25 15.45	2.1875	19 14 21.0	12.166
15	12 44 22.98	2.1227	7 53 8.2	16.402	15	14 27 26.76	2.1897	19 26 27.5	12.051
16	12 46 30.34	2.1228	8 9 30.5	16.340	16	14 29 38.21	2.1920	19 38 27.1	11.935
17	12 48 37.71	2.1230	8 25 49.0	16.276	17	14 31 49.80	2.1942	19 50 19.7	11.817
18	12 50 45.10	2.1232	8 42 3.6	16.211	18	14 34 1.52	2.1965	20 2 5.2	11.699
19	12 52 52.50	2.1235	8 58 14.3	16.145	19	14 36 13.88	2.1989	20 13 43.6	11.581
20	12 54 59.92	2.1238	9 14 21.0	16.078	20	14 38 25.39	2.2013	20 25 14.9	11.462
21	12 57 7.36	2.1242	9 30 23.7	16.010	21	14 40 37.54	2.2037	20 36 39.0	11.341
22	12 59 14.83	2.1248	9 46 22.2	15.939	22	14 42 49.83	2.2060	20 47 55.8	11.220
23	13 1 22.34	2.1254	S. 10 2 16.4	15.867	23	14 45 2.26	2.2084	S. 20 59 5.4	11.099
	FRIDAY 2.					**SUNDAY 4.**			
0	13 3 29.88	2.1260	S. 10 18 6.3	15.795	0	14 47 14.84	2.2108	S. 21 10 7.7	10.977
1	13 5 37.46	2.1267	10 33 51.8	15.721	1	14 49 27.56	2.2132	21 21 2.6	10.853
2	13 7 45.09	2.1275	10 49 32.8	15.646	2	14 51 40.42	2.2155	21 31 50.0	10.728
3	13 9 52.76	2.1283	11 5 9.3	15.569	3	14 53 53.42	2.2178	21 42 29.9	10.603
4	13 12 0.48	2.1292	11 20 41.1	15.491	4	14 56 6.56	2.2202	21 53 2.3	10.477
5	13 14 8.26	2.1302	11 36 8.2	15.412	5	14 58 19.85	2.2227	22 3 27.1	10.351
6	13 16 16.10	2.1312	11 51 30.5	15.331	6	15 0 33.28	2.2250	22 13 44.4	10.224
7	13 18 24.00	2.1322	12 6 47.9	15.249	7	15 2 46.85	2.2273	22 23 54.0	10.096
8	13 20 31.97	2.1333	12 22 0.4	15.167	8	15 5 0.56	2.2297	22 33 55.9	9.967
9	13 22 40.00	2.1344	12 37 7.9	15.083	9	15 7 14.41	2.2320	22 43 50.0	9.838
10	13 24 48.10	2.1357	12 52 10.3	14.998	10	15 9 28.40	2.2343	22 53 36.4	9.708
11	13 26 56.28	2.1370	13 7 7.6	14.911	11	15 11 42.53	2.2367	23 3 15.0	9.577
12	13 29 4.54	2.1383	13 21 59.6	14.823	12	15 13 56.80	2.2389	23 12 45.7	9.446
13	13 31 12.88	2.1397	13 36 46.3	14.734	13	15 16 11.20	2.2412	23 22 8.5	9.314
14	13 33 21.30	2.1411	13 51 27.7	14.644	14	15 18 25.74	2.2435	23 31 23.4	9.182
15	13 35 29.81	2.1426	14 6 3.6	14.553	15	15 20 40.42	2.2457	23 40 30.4	9.050
16	13 37 38.41	2.1442	14 20 34.0	14.461	16	15 22 55.23	2.2479	23 49 29.4	8.916
17	13 39 47.11	2.1457	14 34 58.9	14.367	17	15 25 10.17	2.2502	23 58 20.3	8.781
18	13 41 55.90	2.1473	14 49 18.1	14.272	18	15 27 25.25	2.2524	24 7 3.1	8.646
19	13 44 4.79	2.1490	15 3 31.6	14.177	19	15 29 40.46	2.2545	24 15 37.8	8.511
20	13 46 13.78	2.1507	15 17 39.3	14.080	20	15 31 55.79	2.2566	24 24 4.4	8.376
21	13 48 22.87	2.1524	15 31 41.2	13.982	21	15 34 11.25	2.2587	24 32 22.9	8.239
22	13 50 32.07	2.1542	15 45 37.2	13.884	22	15 36 26.83	2.2607	24 40 33.1	8.102
23	13 52 41.38	2.1561	15 59 27.3	13.784	23	15 38 42.53	2.2627	24 48 35.1	7.965
24	13 54 50.80	2.1580	S. 16 13 11.3	13.683	24	15 40 58.35	2.2647	S. 24 56 28.9	7.827

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 40 58.35	2.2647	S.24 56 28.9	7.827
1	15 43 14.29	2.2667	25 4 14.4	7.688
2	15 45 30.35	2.2686	25 11 51.5	7.549
3	15 47 46.52	2.2704	25 19 20.3	7.410
4	15 50 2.80	2.2722	25 26 40.7	7.271
5	15 52 19.19	2.2740	25 33 52.8	7.131
6	15 54 35.68	2.2758	25 40 56.4	6.989
7	15 56 52.28	2.2775	25 47 51.5	6.848
8	15 59 8.98	2.2791	25 54 38.2	6.707
9	16 1 25.77	2.2807	26 1 16.4	6.566
10	16 3 42.66	2.2823	26 7 46.1	6.423
11	16 5 59.64	2.2838	26 14 7.2	6.281
12	16 8 16.71	2.2853	26 20 19.8	6.138
13	16 10 33.87	2.2867	26 26 23.8	5.995
14	16 12 51.11	2.2879	26 32 19.2	5.852
15	16 15 8.42	2.2892	26 38 6.0	5.708
16	16 17 25.81	2.2904	26 43 41.1	5.563
17	16 19 43.27	2.2916	26 49 13.6	5.420
18	16 22 0.80	2.2927	26 54 34.5	5.276
19	16 24 18.39	2.2937	26 59 46.7	5.131
20	16 26 36.04	2.2947	27 4 50.2	4.986
21	16 28 53.75	2.2957	27 9 45.0	4.841
22	16 31 11.52	2.2966	27 14 31.1	4.695
23	16 33 29.34	2.2973	S.27 19 8.4	4.549

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 35 47.20	2.2980	S.27 23 37.0	4.404
1	16 38 5.10	2.2987	27 27 56.9	4.258
2	16 40 23.04	2.2992	27 32 8.0	4.112
3	16 42 41.01	2.2997	27 36 10.3	3.966
4	16 44 59.01	2.3002	27 40 3.9	3.820
5	16 47 17.04	2.3006	27 43 48.7	3.673
6	16 49 35.08	2.3008	27 47 24.7	3.527
7	16 51 53.14	2.3011	27 50 51.9	3.381
8	16 54 11.21	2.3013	27 54 10.4	3.235
9	16 56 29.29	2.3013	27 57 20.1	3.089
10	16 58 47.37	2.3013	28 0 21.1	2.942
11	17 1 5.45	2.3013	28 3 13.2	2.795
12	17 3 23.53	2.3012	28 5 56.5	2.648
13	17 5 41.60	2.3010	28 8 31.0	2.502
14	17 7 59.65	2.3007	28 10 56.8	2.357
15	17 10 17.68	2.3003	28 13 13.8	2.210
16	17 12 35.68	2.2998	28 15 22.0	2.064
17	17 14 53.66	2.2993	28 17 21.5	1.918
18	17 17 11.60	2.2987	28 19 12.2	1.772
19	17 19 29.50	2.2980	28 20 54.1	1.626
20	17 21 47.36	2.2973	28 22 27.3	1.481
21	17 24 5.18	2.2966	28 23 51.8	1.335
22	17 26 22.95	2.2957	28 25 7.5	1.189
23	17 28 40.66	2.2946	28 26 14.5	1.044
24	17 30 58.30	2.2935	S.28 27 12.8	0.899

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 30 58.30	2.2935	S.28 27 12.8	0.899
1	17 33 15.88	2.2924	28 28 2.4	0.754
2	17 35 33.39	2.2912	28 28 43.3	0.610
3	17 37 50.83	2.2899	28 29 15.6	0.466
4	17 40 8.18	2.2885	28 29 39.2	0.322
5	17 42 25.45	2.2871	28 29 54.2	0.177
6	17 44 42.63	2.2856	28 30 0.5	−0.033
7	17 46 59.72	2.2840	28 29 58.2	+0.109
8	17 49 16.71	2.2823	28 29 47.4	0.252
9	17 51 33.59	2.2805	28 29 28.0	0.394
10	17 53 50.37	2.2787	28 29 0.1	0.537
11	17 56 7.04	2.2768	28 28 23.6	0.679
12	17 58 23.59	2.2748	28 27 38.6	0.820
13	18 0 40.02	2.2728	28 26 45.2	0.961
14	18 2 56.33	2.2707	28 25 43.3	1.102
15	18 5 12.51	2.2686	28 24 32.9	1.243
16	18 7 28.56	2.2663	28 23 14.1	1.383
17	18 9 44.47	2.2639	28 21 46.9	1.522
18	18 12 0.23	2.2615	28 20 11.4	1.662
19	18 14 15.85	2.2591	28 18 27.5	1.801
20	18 16 31.32	2.2566	28 16 35.3	1.938
21	18 18 46.64	2.2541	28 14 34.9	2.076
22	18 21 1.81	2.2514	28 12 26.2	2.213
23	18 23 16.81	2.2486	S.28 10 9.3	2.351

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 25 31.64	2.2457	S.28 7 44.1	2.488
1	18 27 46.30	2.2429	28 5 10.8	2.623
2	18 30 0.79	2.2401	28 2 29.4	2.758
3	18 32 15.11	2.2372	27 59 39.9	2.893
4	18 34 29.25	2.2341	27 56 42.3	3.027
5	18 36 43.20	2.2310	27 53 36.7	3.160
6	18 38 56.97	2.2279	27 50 23.1	3.293
7	18 41 10.55	2.2247	27 47 1.5	3.426
8	18 43 23.93	2.2214	27 43 32.0	3.558
9	18 45 37.12	2.2182	27 39 54.6	3.689
10	18 47 50.11	2.2148	27 36 9.3	3.820
11	18 50 2.89	2.2113	27 32 16.2	3.950
12	18 52 15.47	2.2079	27 28 15.3	4.080
13	18 54 27.84	2.2044	27 24 6.6	4.208
14	18 56 40.00	2.2008	27 19 50.3	4.336
15	18 58 51.94	2.1973	27 15 26.3	4.464
16	19 1 3.67	2.1937	27 10 54.6	4.592
17	19 3 15.18	2.1899	27 6 15.3	4.718
18	19 5 26.46	2.1862	27 1 28.5	4.843
19	19 7 37.52	2.1824	26 56 34.2	4.968
20	19 9 48.35	2.1787	26 51 32.4	5.093
21	19 11 58.96	2.1749	26 46 23.1	5.217
22	19 14 9.34	2.1710	26 41 6.4	5.339
23	19 16 19.48	2.1670	26 35 42.4	5.461
24	19 18 29.38	2.1631	S.26 30 11.1	5.582

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 18 29.38	2.1631	S.26 30 11.1	5.582
1	19 20 39.05	2.1592	26 24 32.5	5.703
2	19 22 48.48	2.1552	26 18 46.7	5.823
3	19 24 57.67	2.1512	26 12 53.8	5.942
4	19 27 6.62	2.1471	26 6 53.7	6.061
5	19 29 15.32	2.1430	26 0 46.5	6.179
6	19 31 23.78	2.1389	25 54 32.2	6.297
7	19 33 31.99	2.1348	25 48 10.9	6.413
8	19 35 39.95	2.1307	25 41 42.7	6.528
9	19 37 47.67	2.1266	25 35 7.6	6.643
10	19 39 55.14	2.1223	25 28 25.6	6.757
11	19 42 2.35	2.1181	25 21 36.8	6.870
12	19 44 9.31	2.1139	25 14 41.2	6.983
13	19 46 16.02	2.1097	25 7 38.8	7.095
14	19 48 22.48	2.1055	25 0 29.8	7.205
15	19 50 28.68	2.1012	24 53 14.2	7.315
16	19 52 34.63	2.0970	24 45 52.0	7.425
17	19 54 40.32	2.0927	24 38 23.2	7.534
18	19 56 45.75	2.0884	24 30 47.9	7.642
19	19 58 50.93	2.0841	24 23 6.2	7.749
20	20 0 55.85	2.0798	24 15 18.0	7.856
21	20 3 0.51	2.0756	24 7 23.5	7.961
22	20 5 4.92	2.0713	23 59 22.7	8.066
23	20 7 9.07	2.0670	S.23 51 15.6	8.171

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 9 12.96	2.0627	S.23 43 2.2	8.274
1	20 11 16.60	2.0585	23 34 42.7	8.376
2	20 13 19.96	2.0542	23 26 17.1	8.477
3	20 15 23.10	2.0499	23 17 45.4	8.578
4	20 17 25.97	2.0457	23 9 7.7	8.678
5	20 19 28.58	2.0413	23 0 24.0	8.777
6	20 21 30.93	2.0371	22 51 34.4	8.876
7	20 23 33.03	2.0329	22 42 38.9	8.973
8	20 25 34.88	2.0287	22 33 37.6	9.070
9	20 27 36.48	2.0245	22 24 30.5	9.166
10	20 29 37.82	2.0203	22 15 17.7	9.262
11	20 31 38.91	2.0161	22 5 59.1	9.357
12	20 33 39.75	2.0119	21 56 34.9	9.450
13	20 35 40.34	2.0078	21 47 5.1	9.542
14	20 37 40.68	2.0037	21 37 29.8	9.634
15	20 39 40.78	1.9996	21 27 49.0	9.725
16	20 41 40.63	1.9954	21 18 2.8	9.815
17	20 43 40.23	1.9913	21 8 11.2	9.905
18	20 45 39.59	1.9872	20 58 14.2	9.994
19	20 47 38.70	1.9832	20 48 11.9	10.082
20	20 49 37.58	1.9793	20 38 4.4	10.168
21	20 51 36.22	1.9753	20 27 51.7	10.255
22	20 53 34.62	1.9713	20 17 33.8	10.341
23	20 55 32.78	1.9674	20 7 10.8	10.425
24	20 57 30.71	1.9636	S.19 56 42.8	10.508

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 57 30.71	1.9636	S.19 56 42.8	10.508
1	20 59 28.41	1.9597	19 46 9.8	10.592
2	21 1 25.88	1.9559	19 35 31.8	10.674
3	21 3 23.12	1.9521	19 24 48.9	10.755
4	21 5 20.13	1.9483	19 14 1.2	10.836
5	21 7 16.91	1.9445	19 3 8.6	10.916
6	21 9 13.47	1.9408	18 52 11.3	10.994
7	21 11 9.81	1.9372	18 41 9.3	11.072
8	21 13 5.93	1.9336	18 30 2.6	11.150
9	21 15 1.84	1.9300	18 18 51.3	11.227
10	21 16 57.53	1.9264	18 7 35.4	11.302
11	21 18 53.01	1.9229	17 56 15.0	11.377
12	21 20 48.28	1.9194	17 44 50.2	11.451
13	21 22 43.34	1.9160	17 33 20.9	11.524
14	21 24 38.20	1.9126	17 21 47.3	11.597
15	21 26 32.85	1.9092	17 10 9.3	11.669
16	21 28 27.30	1.9059	16 58 27.0	11.740
17	21 30 21.56	1.9027	16 46 40.5	11.810
18	21 32 15.62	1.8994	16 34 49.8	11.879
19	21 34 9.49	1.8962	16 22 55.0	11.947
20	21 36 3.17	1.8931	16 10 56.1	12.015
21	21 37 56.66	1.8900	15 58 53.2	12.082
22	21 39 49.97	1.8870	15 46 46.3	12.148
23	21 41 43.10	1.8839	S.15 34 35.5	12.213

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 43 36.04	1.8808	S.15 22 20.7	12.278
1	21 45 28.80	1.8780	15 10 2.1	12.342
2	21 47 21.40	1.8752	14 57 39.7	12.404
3	21 49 13.83	1.8724	14 45 13.6	12.466
4	21 51 6.09	1.8697	14 32 43.8	12.527
5	21 52 58.19	1.8669	14 20 10.4	12.588
6	21 54 50.12	1.8642	14 7 33.3	12.648
7	21 56 41.89	1.8616	13 54 52.6	12.707
8	21 58 33.51	1.8591	13 42 8.5	12.764
9	22 0 24.98	1.8566	13 29 20.9	12.822
10	22 2 16.30	1.8541	13 16 29.9	12.878
11	22 4 7.47	1.8517	13 3 35.6	12.933
12	22 5 58.50	1.8493	12 50 37.9	12.988
13	22 7 49.39	1.8470	12 37 36.9	13.043
14	22 9 40.14	1.8449	12 24 32.8	13.095
15	22 11 30.76	1.8426	12 11 25.5	13.147
16	22 13 21.25	1.8405	11 58 15.1	13.199
17	22 15 11.62	1.8384	11 45 1.6	13.251
18	22 17 1.86	1.8363	11 31 45.0	13.301
19	22 18 51.98	1.8344	11 18 25.5	13.349
20	22 20 41.99	1.8325	11 5 3.1	13.398
21	22 22 31.88	1.8306	10 51 37.7	13.446
22	22 24 21.66	1.8287	10 38 9.5	13.493
23	22 26 11.33	1.8270	10 24 38.6	13.539
24	22 28 0.90	1.8253	S.10 11 4.9	13.584

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 28 0.90	1.8253	S.10 11 4.9	13.584	0	23 54 52.47	1.8189	N. 1 17 27.3	14.780
1	22 29 50.37	1.8237	9 57 28.5	13.628	1	23 56 41.65	1.8204	1 32 14.2	14.784
2	22 31 39.75	1.8222	9 43 49.5	13.672	2	23 58 30.92	1.8220	1 47 1.4	14.787
3	22 33 29.03	1.8207	9 30 7.9	13.715	3	0 0 20.29	1.8236	2 1 48.7	14.789
4	22 35 18.23	1.8192	9 16 23.7	13.757	4	0 2 9.76	1.8253	2 16 36.1	14.790
5	22 37 7.34	1.8178	9 2 37.1	13.798	5	0 3 59.33	1.8272	2 31 23.5	14.790
6	22 38 56.37	1.8165	8 48 48.0	13.839	6	0 5 49.02	1.8291	2 46 10.9	14.789
7	22 40 45.32	1.8153	8 34 56.5	13.878	7	0 7 38.82	1.8310	3 0 58.2	14.787
8	22 42 34.20	1.8141	8 21 2.6	13.917	8	0 9 28.74	1.8330	3 15 45.4	14.784
9	22 44 23.01	1.8129	8 7 6.5	13.954	9	0 11 18.78	1.8351	3 30 32.3	14.780
10	22 46 11.75	1.8118	7 53 8.1	13.991	10	0 13 8.95	1.8372	3 45 19.0	14.776
11	22 48 0.43	1.8108	7 39 7.5	14.028	11	0 14 59.25	1.8394	4 0 5.4	14.770
12	22 49 49.05	1.8099	7 25 4.8	14.063	12	0 16 49.68	1.8417	4 14 51.4	14.763
13	22 51 37.62	1.8090	7 11 0.0	14.098	13	0 18 40.25	1.8441	4 29 37.0	14.756
14	22 53 26.13	1.8081	6 56 53.1	14.133	14	0 20 30.97	1.8466	4 44 22.1	14.747
15	22 55 14.59	1.8073	6 42 44.1	14.166	15	0 22 21.84	1.8491	4 59 6.6	14.737
16	22 57 3.01	1.8067	6 28 33.2	14.197	16	0 24 12.86	1.8517	5 13 50.5	14.726
17	22 58 51.39	1.8060	6 14 20.4	14.228	17	0 26 4.04	1.8543	5 28 33.7	14.714
18	23 0 39.73	1.8054	6 0 5.8	14.258	18	0 27 55.38	1.8571	5 43 16.2	14.702
19	23 2 28.04	1.8049	5 45 49.4	14.288	19	0 29 46.89	1.8599	5 57 57.9	14.688
20	23 4 16.32	1.8044	5 31 31.2	14.318	20	0 31 38.57	1.8627	6 12 38.8	14.673
21	23 6 4.57	1.8040	5 17 11.2	14.347	21	0 33 30.42	1.8657	6 27 18.7	14.657
22	23 7 52.80	1.8037	5 2 49.6	14.373	22	0 35 22.45	1.8687	6 41 57.6	14.640
23	23 9 41.02	1.8035	S. 4 48 26.4	14.399	23	0 37 14.67	1.8718	N. 6 56 35.5	14.623
	WEDNESDAY 14.					**FRIDAY 16.**			
0	23 11 29.22	1.8033	S. 4 34 1.7	14.424	0	0 39 7.67	1.8749	N. 7 11 12.4	14.605
1	23 13 17.41	1.8032	4 19 35.5	14.449	1	0 40 59.66	1.8782	7 25 48.1	14.584
2	23 15 5.60	1.8031	4 5 7.8	14.474	2	0 42 52.45	1.8816	7 40 22.5	14.563
3	23 16 53.78	1.8031	3 50 38.6	14.497	3	0 44 45.45	1.8850	7 54 55.6	14.541
4	23 18 41.97	1.8032	3 36 8.1	14.519	4	0 46 38.65	1.8884	8 9 27.4	14.518
5	23 20 30.17	1.8033	3 21 36.3	14.541	5	0 48 32.06	1.8919	8 23 57.8	14.494
6	23 22 18.37	1.8035	3 7 3.2	14.562	6	0 50 25.68	1.8955	8 38 26.7	14.469
7	23 24 6.59	1.8038	2 52 28.9	14.581	7	0 52 19.52	1.8992	8 52 54.1	14.412
8	23 25 54.83	1.8042	2 37 53.5	14.599	8	0 54 13.58	1.9029	9 7 19.8	14.414
9	23 27 43.09	1.8046	2 23 17.0	14.617	9	0 56 7.87	1.9067	9 21 43.8	14.385
10	23 29 31.38	1.8051	2 8 39.4	14.634	10	0 58 2.39	1.9107	9 36 6.0	14.356
11	23 31 19.70	1.8056	1 54 0.9	14.650	11	0 59 57.15	1.9147	9 50 26.5	14.326
12	23 33 8.05	1.8062	1 39 21.4	14.666	12	1 1 52.15	1.9187	10 4 45.1	14.293
13	23 34 56.44	1.8069	1 24 41.0	14.680	13	1 3 47.39	1.9228	10 19 1.7	14.260
14	23 36 44.88	1.8077	1 9 59.8	14.694	14	1 5 42.88	1.9270	10 33 16.3	14.227
15	23 38 33.36	1.8084	0 55 17.7	14.707	15	1 7 38.63	1.9312	10 47 28.9	14.192
16	23 40 21.89	1.8093	0 40 34.9	14.718	16	1 9 34.63	1.9355	11 1 39.3	14.155
17	23 42 10.48	1.8103	0 25 51.5	14.729	17	1 11 30.89	1.9399	11 15 47.5	14.117
18	23 43 59.13	1.8113	S. 0 11 7.4	14.740	18	1 13 27.42	1.9444	11 29 53.4	14.078
19	23 45 47.84	1.8123	N. 0 3 37.3	14.749	19	1 15 24.22	1.9489	11 43 56.9	14.038
20	23 47 36.61	1.8134	0 18 22.5	14.757	20	1 17 21.29	1.9535	11 57 58.0	13.997
21	23 49 25.45	1.8147	0 33 8.1	14.764	21	1 19 18.64	1.9582	12 11 56.6	13.955
22	23 51 14.37	1.8161	0 47 54.2	14.771	22	1 21 16.27	1.9629	12 25 52.6	13.912
23	23 53 3.38	1.8175	1 2 40.6	14.776	23	1 23 14.19	1.9677	12 39 46.0	13.868
24	23 54 52.47	1.8189	N. 1 17 27.3	14.780	24	1 25 12.40	1.9726	N.12 53 36.7	13.822

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 25 12.40	1.9736	N.12 53 36.7	13.822
1	1 27 10.90	1.9775	13 7 24.6	13.774
2	1 29 9.70	1.9826	13 21 9.6	13.726
3	1 31 8.81	1.9877	13 34 51.7	13.677
4	1 33 8.23	1.9928	13 48 30.8	13.625
5	1 35 7.95	1.9980	14 2 6.7	13.573
6	1 37 7.99	2.0033	14 15 39.5	13.520
7	1 39 8.35	2.0087	14 29 9.1	13.466
8	1 41 9.03	2.0141	14 42 35.4	13.409
9	1 43 10.04	2.0195	14 55 58.2	13.351
10	1 45 11.37	2.0250	15 9 17.5	13.293
11	1 47 13.04	2.0307	15 22 33.3	13.234
12	1 49 15.05	2.0363	15 35 45.6	13.173
13	1 51 17.40	2.0421	15 48 54.1	13.110
14	1 53 20.10	2.0479	16 1 58.8	13.047
15	1 55 23.15	2.0537	16 14 59.7	12.982
16	1 57 26.55	2.0596	16 27 56.7	12.916
17	1 59 30.30	2.0655	16 40 49.6	12.848
18	2 1 34.41	2.0716	16 53 38.4	12.778
19	2 3 38.89	2.0777	17 6 23.0	12.708
20	2 5 43.74	2.0838	17 19 3.4	12.637
21	2 7 48.95	2.0899	17 31 39.4	12.563
22	2 9 54.53	2.0962	17 44 10.9	12.488
23	2 12 0.49	2.1025	N.17 56 38.0	12.413

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 14 6.83	2.1088	N.18 9 0.5	12.336
1	2 16 13.55	2.1152	8 21 18.3	12.257
2	2 18 20.66	2.1217	18 33 31.3	12.177
3	2 20 28.15	2.1282	18 45 39.5	12.095
4	2 22 36.04	2.1347	18 57 42.7	12.012
5	2 24 44.32	2.1413	19 9 40.9	11.928
6	2 26 53.00	2.1480	19 21 34.0	11.842
7	2 29 2.08	2.1547	19 33 21.9	11.754
8	2 31 11.56	2.1613	19 45 4.5	11.665
9	2 33 21.44	2.1681	19 56 41.7	11.575
10	2 35 31.73	2.1749	20 8 13.5	11.484
11	2 37 42.43	2.1817	20 19 39.8	11.391
12	2 39 53.53	2.1885	20 31 0.4	11.296
13	2 42 5.05	2.1954	20 42 15.3	11.200
14	2 44 16.98	2.2023	20 53 24.4	11.102
15	2 46 29.33	2.2093	21 4 27.6	11.003
16	2 48 42.10	2.2163	21 15 24.8	10.903
17	2 50 55.29	2.2232	21 26 15.9	10.801
18	2 53 8.89	2.2302	21 37 0.9	10.697
19	2 55 22.92	2.2373	21 47 39.6	10.592
20	2 57 37.37	2.2443	21 58 12.0	10.486
21	2 59 52.24	2.2514	22 8 37.9	10.378
22	3 2 7.54	2.2585	22 18 57.3	10.268
23	3 4 23.26	2.2656	22 29 10.1	10.157
24	3 6 39.41	2.2727	N.22 39 16.2	10.045

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 6 39.41	2.2727	N.22 39 16.2	10.045
1	3 8 55.99	2.2799	22 49 15.5	9.931
2	3 11 13.00	2.2870	22 59 7.9	9.815
3	3 13 30.43	2.2941	23 8 53.3	9.698
4	3 15 48.29	2.3012	23 18 31.7	9.580
5	3 18 6.58	2.3084	23 28 2.9	9.459
6	3 20 25.30	2.3156	23 37 26.8	9.338
7	3 22 44.45	2.3227	23 46 43.4	9.215
8	3 25 4.02	2.3298	23 55 52.6	9.090
9	3 27 24.02	2.3369	24 4 54.2	8.963
10	3 29 44.45	2.3440	24 13 48.2	8.836
11	3 32 5.30	2.3510	24 22 34.6	8.707
12	3 34 26.57	2.3581	24 31 13.1	8.576
13	3 36 48.27	2.3652	24 39 43.7	8.444
14	3 39 10.39	2.3721	24 48 6.4	8.311
15	3 41 32.92	2.3790	24 56 21.0	8.176
16	3 43 55.87	2.3860	25 4 27.5	8.039
17	3 46 19.24	2.3930	25 12 25.7	7.900
18	3 48 43.03	2.3999	25 20 15.5	7.760
19	3 51 7.23	2.4067	25 27 56.9	7.620
20	3 53 31.83	2.4134	25 35 29.9	7.478
21	3 55 56.84	2.4202	25 42 54.3	7.334
22	3 58 22.25	2.4268	25 50 10.0	7.188
23	4 0 48.06	2.4335	N.25 57 16.9	7.041

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 3 14.27	2.4401	N.26 4 14.9	6.893
1	4 5 40.87	2.4466	26 11 4.0	6.743
2	4 8 7.86	2.4531	26 17 44.1	6.592
3	4 10 35.24	2.4595	26 24 15.1	6.440
4	4 13 3.00	2.4658	26 30 36.9	6.287
5	4 15 31.14	2.4721	26 36 49.5	6.132
6	4 17 59.65	2.4782	26 42 52.7	5.975
7	4 20 28.53	2.4843	26 48 46.5	5.817
8	4 22 57.77	2.4903	26 54 30.8	5.658
9	4 25 27.37	2.4963	27 0 5.5	5.498
10	4 27 57.33	2.5022	27 5 30.5	5.336
11	4 30 27.64	2.5080	27 10 45.8	5.173
12	4 32 58.29	2.5137	27 15 51.3	5.009
13	4 35 29.28	2.5193	27 20 46.9	4.843
14	4 38 0.60	2.5248	27 25 32.5	4.677
15	4 40 32.25	2.5302	27 30 8.1	4.509
16	4 43 4.22	2.5354	27 34 33.6	4.341
17	4 45 36.50	2.5406	27 38 49.0	4.171
18	4 48 9.09	2.5457	27 42 54.1	3.999
19	4 50 41.98	2.5507	27 46 48.9	3.827
20	4 53 15.17	2.5555	27 50 33.4	3.654
21	4 55 48.64	2.5602	27 54 7.4	3.479
22	4 58 22.39	2.5648	27 57 30.9	3.303
23	5 0 56.41	2.5693	28 0 43.8	3.127
24	5 3 30.70	2.5737	N.28 3 46.2	2.951

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 3 30.70	2.5737	N.28 3 46.2	2.951
1	5 6 5.25	2.5779	28 6 37.9	2.772
2	5 8 40.05	2.5819	28 9 18.8	2.593
3	5 11 15.08	2.5858	28 11 49.0	2.413
4	5 13 50.35	2.5897	28 14 8.4	2.232
5	5 16 25.85	2.5934	28 16 16.9	2.050
6	5 19 1.56	2.5969	28 18 14.4	1.867
7	5 21 37.48	2.6003	28 20 1.0	1.684
8	5 24 13.60	2.6037	28 21 36.5	1.500
9	5 26 49.92	2.6068	28 23 1.0	1.316
10	5 29 26.42	2.6098	28 24 14.4	1.130
11	5 32 3.09	2.6126	28 25 16.6	0.943
12	5 34 39.93	2.6153	28 26 7.6	0.757
13	5 37 16.92	2.6178	28 26 47.4	0.570
14	5 39 54.06	2.6202	28 27 16.0	0.382
15	5 42 31.34	2.6224	28 27 33.3	0.194
16	5 45 8.75	2.6245	28 27 39.3	+0.006
17	5 47 46.28	2.6263	28 27 34.0	−0.183
18	5 50 23.91	2.6280	28 27 17.3	0.372
19	5 53 1.64	2.6297	28 26 49.3	0.562
20	5 55 39.47	2,6312	28 26 9.8	0.753
21	5 58 17.38	2.6324	28 25 18.9	0.943
22	6 0 55.36	2.6335	28 24 16.6	1.134
23	6 3 33.40	2.6344	N.28 23 2.8	1.326

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 6 11.49	2.6352	N.28 21 37.5	1.517
1	6 8 49.63	2.6359	28 20 0.8	1.708
2	6 11 27.80	2.6364	28 18 12.6	1.899
3	6 14 6.00	2.6367	28 16 12.9	2.090
4	6 16 44.21	2.6369	28 14 1.8	2.281
5	6 19 22.43	2.6369	28 11 39.2	2.472
6	6 22 0.64	2.6368	28 9 5.1	2.664
7	6 24 38.84	2.6365	28 6 19.5	2.855
8	6 27 17.02	2.6360	28 3 22.5	3.046
9	6 29 55.16	2.6354	28 0 14.0	3.237
10	6 32 33.26	2.6347	27 56 54.0	3.428
11	6 35 11.32	2.6338	27 53 22.6	3.618
12	6 37 49.32	2.6327	27 49 39.8	3.808
13	6 40 27.25	2.6315	27 45 45.6	3.998
14	6 43 5.10	2.6301	27 41 40.0	4.188
15	6 45 42.86	2.6286	27 37 23.0	4.377
16	6 48 20.53	2.6270	27 32 54.7	4.566
17	6 50 58.10	2.6252	27 28 15.1	4.754
18	6 53 35.55	2.6232	27 23 24.2	4.942
19	6 56 12.88	2.6211	27 18 22.0	5.130
20	6 58 50.08	2.6189	27 13 8.6	5.316
21	7 1 27.15	2.6166	27 7 44.1	5.502
22	7 4 4.07	2.6141	27 2 8.4	5.687
23	7 6 40.84	2.6115	26 56 21.6	5.872
24	7 9 17.45	2.6087	N.26 50 23.7	6.057

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 9 17.45	2.6087	N.26 50 23.7	6.057
1	7 11 53.89	2.6058	26 44 14.8	6.240
2	7 14 30.15	2.6028	26 37 54.9	6.422
3	7 17 6.23	2.5997	26 31 24.1	6.604
4	7 19 42.12	2.5965	26 24 42.4	6.785
5	7 22 17.81	2.5932	26 17 49.9	6.964
6	7 24 53.30	2.5898	26 10 46.7	7.143
7	7 27 28.58	2.5862	26 3 32.8	7.322
8	7 30 3.64	2.5824	25 56 8.1	7.500
9	7 32 38.47	2.5786	25 48 32.8	7.676
10	7 35 13.08	2.5748	25 40 47.0	7.851
11	7 37 47.45	2.5708	25 32 50.7	8.025
12	7 40 21.58	2.5667	25 24 44.0	8.197
13	7 42 55.46	2.5626	25 16 27.0	8.369
14	7 45 29.09	2.5583	25 7 59.7	8.541
15	7 48 2.46	2.5540	24 59 22.1	8.711
16	7 50 35.57	2.5496	24 50 34.4	8.879
17	7 53 8.41	2.5450	24 41 36.7	9.046
18	7 55 40.97	2.5404	24 32 28.9	9.212
19	7 58 13.26	2.5358	24 23 11.2	9.377
20	8 0 45.27	2.5311	24 13 43.7	9.539
21	8 3 16.99	2.5263	24 4 6.5	9.701
22	8 5 48.42	2.5214	23 54 19.6	9.862
23	8 8 19.56	2.5165	N.23 44 23.0	10.022

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 10 50.40	2.5115	N.23 34 16.9	10.180
1	8 13 20.94	2.5065	23 24 1.4	10.337
2	8 15 51.18	2.5014	23 13 36.5	10.492
3	8 18 21.11	2.4963	23 3 2.4	10.645
4	8 20 50.74	2.4912	22 52 19.1	10.797
5	8 23 20.05	2.4859	22 41 26.7	10.948
6	8 25 49.05	2.4807	22 30 25.3	11.097
7	8 28 17.74	2.4755	22 19 15.0	11.245
8	8 30 46.11	2.4701	22 7 55.9	11.392
9	8 33 14.15	2.4647	21 56 28.0	11.537
10	8 35 41.87	2.4593	21 44 51.5	11.679
11	8 38 9.27	2.4540	21 33 6.5	11.820
12	8 40 36.35	2.4486	21 21 13.1	11.960
13	8 43 3.10	2.4432	21 9 11.3	12.098
14	8 45 29.53	2.4377	20 57 1.3	12.234
15	8 47 55.63	2.4322	20 44 43.2	12.369
16	8 50 21.40	2.4268	20 32 17.0	12.503
17	8 52 46.85	2.4214	20 19 42.8	12.635
18	8 55 11.97	2.4159	20 7 0.8	12.765
19	8 57 36.76	2.4104	19 54 11.0	12.893
20	9 0 1.22	2.4049	19 41 13.6	13.019
21	9 2 25.35	2.3995	19 28 8.7	13.144
22	9 4 49.16	2.3941	19 14 56.3	13.267
23	9 7 12.64	2.3886	19 1 36.6	13.388
24	9 9 35.79	2.3832	N.18 48 9.7	13.508

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 9 35.79	2.3832	N.18 48 9.7	13.508
1	9 11 58.62	2.3777	18 34 35.7	13.626
2	9 14 21.12	2.3723	18 20 54.6	13.742
3	9 16 43.30	2.3670	18 7 6.6	13.857
4	9 19 5.16	2.3617	17 53 11.8	13.969
5	9 21 26.70	2.3563	17 39 10.3	14.079
6	9 23 47.92	2.3510	17 25 2.3	14.188
7	9 26 8.82	2.3457	17 10 47.8	14.295
8	9 28 29.41	2.3405	16 56 26.9	14.401
9	9 30 49.68	2.3353	16 41 59.7	14.504
10	9 33 9.64	2.3301	16 27 26.4	14.606
11	9 35 29.29	2.3249	16 12 47.0	14.706
12	9 37 48.63	2.3198	15 58 1.7	14.803
13	9 40 7.67	2.3148	15 43 10.6	14.899
14	9 42 26.41	2.3098	15 28 13.8	14.994
15	9 44 44.84	2.3048	15 13 11.3	15.087
16	9 47 2.98	2.2999	14 58 3.3	15.177
17	9 49 20.83	2.2950	14 42 50.0	15.265
18	9 51 38.38	2.2901	14 27 31.5	15.352
19	9 53 55.64	2.2853	14 12 7.8	15.437
20	9 56 12.62	2.2807	13 56 39.0	15.521
21	9 58 29.32	2.2760	13 41 5.3	15.602
22	10 0 45.74	2.2714	13 25 26.8	15.682
23	10 3 1.89	2.2668	N.13 9 43.5	15.760

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 5 17.76	2.2623	N.12 53 55.6	15.835
1	10 7 33.36	2.2578	12 38 3.3	15.908
2	10 9 48.70	2.2535	12 22 6.6	15.981
3	10 12 3.78	2.2492	12 6 5.6	16.051
4	10 14 18.60	2.2449	11 50 0.5	16.119
5	10 16 33.17	2.2407	11 33 51.3	16.186
6	10 18 47.49	2.2366	11 17 38.2	16.250
7	10 21 1.56	2.2325	11 1 21.3	16.312
8	10 23 15.39	2.2285	10 45 0.7	16.373
9	10 25 28.98	2.2246	10 28 36.5	16.432
10	10 27 42.34	2.2207	10 12 8.8	16.489
11	10 29 55.47	2.2169	9 55 37.8	16.543
12	10 32 8.37	2.2132	9 39 3.6	16.597
13	10 34 21.05	2.2096	9 22 26.2	16.648
14	10 36 33.52	2.2060	9 5 45.8	16.698
15	10 38 45.77	2.2024	8 49 2.4	16.747
16	10 40 57.81	2.1990	8 32 16.2	16.793
17	10 43 9.65	2.1957	8 15 27.3	16.836
18	10 45 21.29	2.1924	7 58 35.9	16.878
19	10 47 32.74	2.1892	7 41 42.0	16.918
20	10 49 43.99	2.1860	7 24 45.7	16.957
21	10 51 55.06	2.1830	7 7 47.2	16.993
22	10 54 5.95	2.1800	6 50 46.5	17.028
23	10 56 16.66	2.1771	6 33 43.8	17.061
24	10 58 27.20	2.1743	N. 6 16 39.2	17.093

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 58 27.20	2.1743	N. 6 16 39.2	17.093
1	11 0 37.57	2.1715	5 59 32.7	17.122
2	11 2 47.78	2.1688	5 42 24.6	17.148
3	11 4 57.83	2.1662	5 25 14.9	17.174
4	11 7 7.73	2.1637	5 8 3.7	17.198
5	11 9 17.48	2.1612	4 50 51.2	17.219
6	11 11 27.08	2.1588	4 33 37.4	17.240
7	11 13 36.54	2.1566	4 16 22.4	17.258
8	11 15 45.87	2.1544	3 59 6.4	17.274
9	11 17 55.07	2.1523	3 41 49.5	17.289
10	11 20 4.15	2.1502	3 24 31.7	17.302
11	11 22 13.10	2.1482	3 7 13.2	17.313
12	11 24 21.94	2.1464	2 49 54.1	17.322
13	11 26 30.67	2.1447	2 32 34.5	17.330
14	11 28 39.30	2.1429	2 15 14.5	17.336
15	11 30 47.82	2.1412	1 57 54.2	17.340
16	11 32 56.24	2.1396	1 40 33.7	17.342
17	11 35 4.57	2.1382	1 23 13.2	17.342
18	11 37 12.82	2.1368	1 5 52.7	17.341
19	11 39 20.99	2.1355	0 48 32.3	17.337
20	11 41 29.08	2.1342	0 31 12.2	17.332
21	11 43 37.09	2.1330	N. 0 13 52.4	17.326
22	11 45 45.04	2.1320	S. 0 3 26.9	17.318
23	11 47 52.93	2.1309	S. 0 20 45.7	17.308

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 50 0.75	2.1299	S. 0 38 3.9	17.297
1	11 52 8.52	2.1291	0 55 21.3	17.283
2	11 54 16.25	2.1284	1 12 37.8	17.267
3	11 56 23.93	2.1277	1 29 53.3	17.250
4	11 58 31.57	2.1270	1 47 7.8	17.232
5	12 0 39.17	2.1265	2 4 21.1	17.211
6	12 2 46.75	2.1261	2 21 33.1	17.188
7	12 4 54.30	2.1257	2 38 43.7	17.165
8	12 7 1.83	2.1253	2 55 52.9	17.140
9	12 9 9.34	2.1251	3 13 0.5	17.112
10	12 11 16.84	2.1249	3 30 6.4	17.083
11	12 13 24.33	2.1248	3 47 10.5	17.053
12	12 15 31.82	2.1248	4 4 12.7	17.021
13	12 17 39.31	2.1249	4 21 13.0	16.988
14	12 19 46.81	2.1251	4 38 11.2	16.952
15	12 21 54.32	2.1253	4 55 7.2	16.914
16	12 24 1.84	2.1255	5 12 0.9	16.876
17	12 26 9.38	2.1259	5 28 52.3	16.836
18	12 28 16.95	2.1264	5 45 41.2	16.793
19	12 30 24.55	2.1268	6 2 27.5	16.750
20	12 32 32.17	2.1273	6 19 11.2	16.705
21	12 34 39.83	2.1280	6 35 52.1	16.658
22	12 36 47.53	2.1287	6 52 30.2	16.610
23	12 38 55.27	2.1294	7 9 5.3	16.560
24	12 41 3.06	2.1302	S. 7 25 37.4	16.509

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 41 3.06	2.1302	S. 7 25 37.4	16.509
1	12 43 10.90	2.1312	7 42 6.4	16.456
2	12 45 18.80	2.1322	7 58 32.1	16.401
3	12 47 26.76	2.1333	8 14 54.5	16.345
4	12 49 34.79	2.1344	8 31 13.5	16.287
5	12 51 42.89	2.1355	8 47 29.0	16.228
6	12 53 51.05	2.1367	9 3 40.9	16.167
7	12 55 59.29	2.1380	9 19 49.1	16.105
8	12 58 7.61	2.1393	9 35 53.5	16.042
9	13 0 16.01	2.1407	9 51 54.1	15.977
10	13 2 24.50	2.1422	10 7 50.7	15.910
11	13 4 33.08	2.1437	10 23 43.3	15.842
12	13 6 41.75	2.1452	10 39 31.7	15.772
13	13 8 50.51	2.1469	10 55 15.9	15.701
14	13 10 59.38	2.1487	11 10 55.8	15.628
15	13 13 8.35	2.1504	11 26 31.3	15.554
16	13 15 17.43	2.1522	11 42 2.3	15.478
17	13 17 26.62	2.1541	11 57 28.7	15.402
18	13 19 35.92	2.1560	12 12 50.5	15.323
19	13 21 45.34	2.1579	12 28 7.5	15.243
20	13 23 54.87	2.1598	12 43 19.7	15.162
21	13 26 4.52	2.1619	12 58 27.0	15.080
22	13 28 14.30	2.1641	13 13 29.3	14.996
23	13 30 24.21	2.1662	S. 13 28 26.5	14.911

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 32 34.25	2.1684	S. 13 43 18.6	14.824
1	13 34 44.42	2.1706	13 58 5.4	14.736
2	13 36 54.72	2.1728	14 12 46.9	14.647
3	13 39 5.16	2.1752	14 27 23.0	14.557
4	13 41 15.74	2.1775	14 41 53.7	14.465
5	13 43 26.46	2.1799	14 56 18.8	14.371
6	13 45 37.33	2.1823	15 10 38.2	14.276
7	13 47 48.34	2.1848	15 24 51.9	14.181
8	13 49 59.50	2.1873	15 38 59.9	14.084
9	13 52 10.82	2.1899	15 53 2.0	13.985
10	13 54 22.29	2.1924	16 6 58.1	13.885
11	13 56 33.91	2.1949	16 20 48.2	13.785
12	13 58 45.68	2.1975	16 34 32.3	13.683
13	14 0 57.61	2.2002	16 48 10.2	13.580
14	14 3 9.70	2.2028	17 1 41.9	13.475
15	14 5 21.95	2.2056	17 15 7.2	13.368
16	14 7 34.37	2.2083	17 28 26.1	13.262
17	14 9 46.95	2.2110	17 41 38.6	13.154
18	14 11 59.69	2.2137	17 54 44.6	13.045
19	14 14 12.59	2.2164	18 7 44.0	12.934
20	14 16 25.66	2.2192	18 20 36.7	12.822
21	14 18 38.90	2.2221	18 33 22.7	12.710
22	14 20 52.31	2.2248	18 46 1.9	12.596
23	14 23 5.88	2.2276	18 58 34.2	12.481
24	14 25 19.62	2.2304	S. 19 10 59.6	12.365

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 25 19.62	2.2304	S. 19 10 59.6	12.365
1	14 27 33.53	2.2332	19 23 18.0	12.248
2	14 29 47.61	2.2361	19 35 29.3	12.130
3	14 32 1.86	2.2389	19 47 33.6	12.012
4	14 34 16.28	2.2418	19 59 30.7	11.891
5	14 36 30.88	2.2447	20 11 20.5	11.769
6	14 38 45.65	2.2476	20 23 3.0	11.647
7	14 41 0.59	2.2503	20 34 38.1	11.523
8	14 43 15.69	2.2531	20 46 5.8	11.399
9	14 45 30.96	2.2559	20 57 26.0	11.274
10	14 47 46.40	2.2588	21 8 38.7	11.148
11	14 50 2.01	2.2616	21 19 43.8	11.021
12	14 52 17.79	2.2643	21 30 41.2	10.893
13	14 54 33.73	2.2671	21 41 30.9	10.764
14	14 56 49.84	2.2699	21 52 12.9	10.634
15	14 59 6.12	2.2727	22 2 47.0	10.503
16	15 1 22.56	2.2754	22 13 13.2	10.371
17	15 3 39.16	2.2781	22 23 31.5	10.239
18	15 5 55.93	2.2808	22 33 41.9	10.107
19	15 8 12.86	2.2834	22 43 44.3	9.972
20	15 10 29.94	2.2860	22 53 38.5	9.836
21	15 12 47.18	2.2886	23 3 24.6	9.701
22	15 15 4.57	2.2912	23 13 2.6	9.565
23	15 17 22.12	2.2937	S. 23 22 32.4	9.427

SUNDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 19 39.82	2.2962	S. 23 31 53.9	9.289

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, . .	6	10	1.1
● New Moon, . . .	14	14	53.8
☽ First Quarter, . .	22	1	9.3
○ Full Moon, . . .	28	17	49.0

	d	h
☾ Apogee, ...	10	5.8
☾ Perigee, ...	26	4.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	73° 12′ 0″	2206	75° 0′ 18″	2221	76° 48′ 13″	2237	78° 35′ 45″	2253
	Regulus	W.	36 17 28	2202	38 5 52	2217	39 53 54	2233	41 41 32	2249
	Antares	E.	63 38 7	2202	61 49 42	2217	60 1 40	2233	58 14 2	2249
	Mars	E.	85 36 7	2418	83 52 58	2433	82 10 11	2450	80 27 48	2467
	Jupiter	E.	85 41 50	2262	83 54 55	2278	82 8 23	2294	80 22 15	2310
2	Pollux	W.	87 27 20	2339	89 12 23	2356	90 57 1	2375	92 41 12	2393
	Regulus	W.	50 33 37	2335	52 18 46	2352	54 3 30	2371	55 47 47	2389
	Antares	E.	49 21 56	2335	47 36 47	2353	45 52 4	2371	44 7 47	2389
	Jupiter	E.	71 37 40	2398	69 54 2	2416	68 10 50	2435	66 28 5	2454
	Mars	E.	72 2 1	2558	70 22 8	2577	68 42 42	2596	67 3 42	2615
	α Aquilæ	E.	101 35 16	3114	100 7 24	3124	98 39 44	3135	97 12 17	3148
3	Pollux	W.	101 15 32	2486	102 57 5	2505	104 38 11	2524	106 18 51	2543
	Regulus	W.	64 22 38	2482	66 4 17	2500	67 45 30	2520	69 26 16	2538
	Antares	E.	35 32 59	2482	33 51 21	2503	32 10 10	2520	30 29 25	2539
	Jupiter	E.	58 1 6	2551	56 21 4	2572	54 41 30	2591	53 2 23	2612
	Mars	E.	58 55 23	2716	57 19 4	2737	55 43 13	2757	54 7 49	2778
	α Aquilæ	E.	89 59 17	3229	88 33 42	3249	87 8 31	3270	85 43 45	3292
	Sun	E.	130 31 56	2813	128 57 45	2833	127 24 0	2854	125 50 42	2874
4	Regulus	W.	77 43 43	2630	79 21 57	2649	80 59 46	2666	82 37 11	2684
	Spica	W.	23 45 20	2639	25 23 22	2655	27 1 2	2672	28 38 19	2689
	Jupiter	E.	44 53 42	2713	43 17 20	2734	41 41 25	2755	40 5 58	2775
	Mars	E.	46 17 30	2880	44 44 46	2901	43 12 28	2921	41 40 36	2942
	α Aquilæ	E.	78 46 39	3418	77 24 43	3446	76 3 18	3475	74 42 26	3506
	Sun	E.	118 10 37	2973	116 39 51	2993	115 9 30	3013	113 39 33	3031
5	Regulus	W.	90 38 29	2769	92 13 38	2784	93 48 27	2800	95 22 55	2815
	Spica	W.	36 39 7	2772	38 14 12	2788	39 48 56	2803	41 23 20	2818
	Jupiter	E.	32 15 35	2883	30 42 54	2906	29 10 43	2930	27 39 2	2954
	Mars	E.	34 7 43	3044	32 38 25	3065	31 9 33	3086	29 41 6	3108
	α Aquilæ	E.	68 6 54	3675	66 49 40	3712	65 33 6	3752	64 17 14	3792
	Sun	E.	106 15 33	3123	104 47 51	3141	103 20 31	3158	101 53 31	3173
6	Regulus	W.	103 10 28	2886	104 43 5	2899	106 15 25	2912	107 47 29	2924
	Spica	W.	49 10 37	2888	50 43 11	2901	52 15 29	2913	53 47 31	2926
	α Aquilæ	E.	58 9 2	4028	56 57 50	4082	55 47 31	4139	54 38 7	4199
	Sun	E.	94 43 17	3251	93 18 8	3265	91 53 16	3279	90 28 40	3292
7	Spica	W.	61 24 0	2980	62 54 38	2989	64 25 5	2998	65 55 20	3006
	Antares	W.	15 30 10	2982	17 0 45	2991	18 31 9	2999	20 1 23	3008
	α Aquilæ	E.	49 6 21	4563	48 3 24	4650	47 1 42	4745	46 1 20	4848
	Sun	E.	83 29 18	3351	82 6 6	3361	80 43 5	3371	79 20 15	3380
8	Spica	W.	73 24 10	3042	74 53 31	3048	76 22 44	3053	77 51 51	3056
	Antares	W.	27 30 8	3042	28 59 29	3048	30 28 42	3053	31 57 49	3056
	Sun	E.	72 28 35	3420	71 6 41	3426	69 44 54	3432	68 23 14	3437
9	Spica	W.	85 16 7	3076	86 44 46	3078	88 13 22	3080	89 41 56	3082
	Antares	W.	39 22 7	3076	40 50 46	3078	42 19 23	3079	43 47 58	3081
	Jupiter	W.	17 7 44	3331	18 31 20	3305	19 55 26	3282	21 19 58	3264
	Mars	W.	13 0 7	3587	14 18 55	3543	15 38 32	3508	16 58 47	3483

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	80° 22′ 53″	2270	82° 9′ 37″	2286	83° 55′ 57″	2304	85° 41′ 51″	2321
	Regulus	W.	43 28 46	2266	45 15 36	2283	47 2 2	2300	48 48 2	2317
	Antares	E.	56 26 47	2266	54 39 57	2283	52 53 31	2300	51 7 31	2317
	Mars	E.	78 45 49	2485	77 4 14	2502	75 23 4	2521	73 42 20	2539
	Jupiter	E.	78 36 30	2327	76 51 10	2344	75 6 14	2362	73 21 44	2380
2	Pollux	W.	94 24 57	2412	96 8 15	2430	97 51 7	2448	99 33 33	2467
	Regulus	W.	57 31 38	2407	59 15 3	2426	60 58 1	2444	62 40 33	2463
	Antares	E.	42 23 56	2408	40 40 32	2426	38 57 34	2445	37 15 3	2464
	Jupiter	E.	64 45 47	2473	63 3 56	2492	61 22 32	2512	59 41 35	2532
	Mars	E.	65 25 8	2636	63 47 1	2655	62 9 21	2675	60 32 8	2696
	α Aquilæ	E.	95 45 5	3161	94 18 9	3177	92 51 32	3193	91 25 14	3210
3	Pollux	W.	107 59 4	2561	109 38 52	2580	111 18 14	2599	112 57 11	2618
	Regulus	W.	71 6 37	2556	72 46 32	2575	74 26 1	2593	76 5 5	2612
	Antrres	E.	28 49 6	2558	27 9 13	2577	25 29 47	2596	23 50 46	2614
	Jupiter	E.	51 23 44	2632	49 45 32	2652	48 7 48	2672	46 30 31	2693
	Mars	E.	52 32 52	2798	50 58 22	2818	49 24 18	2839	47 50 41	2859
	α Aquilæ	E.	84 19 24	3315	82 55 30	3339	81 32 4	3364	80 9 6	3391
	Sun	E.	124 17 50	2894	122 45 24	2914	121 13 23	2935	119 41 48	2954
4	Regulus	W.	84 14 12	2701	85 50 50	2719	87 27 5	2735	89 2 58	2752
	Spica	W.	30 15 13	2706	31 51 45	2723	33 27 54	2740	35 3 41	2756
	Jupiter	E.	38 30 58	2797	36 56 26	2818	35 22 21	2839	33 48 44	2861
	Mars	E.	40 9 10	2962	38 38 10	2982	37 7 35	3003	35 37 26	3024
	α Aquilæ	E.	73 22 8	3537	72 2 25	3570	70 43 18	3603	69 24 47	3638
	Sun	E.	112 9 59	3050	110 40 48	3069	109 12 1	3087	107 43 36	3105
5	Regulus	W.	96 57 4	2830	98 30 53	2845	100 4 23	2859	101 37 34	2873
	Spica	W.	42 57 25	2833	44 31 10	2847	46 4 37	2861	47 37 46	2875
	Jupiter	E.	26 7 52	2981	24 37 15	3008	23 7 12	3039	21 37 47	3073
	Mars	E.	28 13 6	3129	26 45 32	3152	25 18 25	3175	23 51 46	3199
	α Aquilæ	E.	63 2 4	3836	61 47 39	3880	60 33 59	3926	59 21 6	3975
	Sun	E.	100 26 50	3190	99 0 29	3206	97 34 27	3221	96 8 43	3236
6	Regulus	W.	109 19 18	2935	110 50 52	2947	112 22 11	2958	113 53 17	2968
	Spica	W.	55 19 17	2937	56 50 49	2949	58 22 6	2960	59 53 10	2970
	α Aquilæ	E.	53 29 40	4263	52 22 13	4331	51 15 49	4404	50 10 31	4480
	Sun	E.	89 4 19	3305	87 40 13	3317	86 16 21	3329	84 52 43	3340
7	Spica	W.	67 25 25	3014	68 55 20	3022	70 25 5	3029	71 54 42	3036
	Antares	W.	21 31 26	3015	23 1 20	3023	24 31 4	3030	26 0 40	3036
	α Aquilæ	E.	45 2 23	4958	44 4 54	5077	43 8 59	5206	42 14 42	5348
	Sun	E.	77 57 36	3389	76 35 7	3398	75 12 48	3405	73 50 37	3413
8	Spica	W.	79 20 52	3063	80 49 47	3066	82 18 38	3070	83 47 24	3073
	Antares	W.	33 26 50	3062	34 55 46	3066	36 24 37	3069	37 53 24	3073
	Sun	E.	67 1 39	3442	65 40 10	3446	64 18 46	3450	62 57 26	3454
9	Spica	W.	91 10 28	3082	92 38 59	3083	94 7 29	3083	95 35 59	3083
	Antares	W.	45 16 31	3082	46 45 3	3082	48 13 34	3082	49 42 5	3079
	Jupiter	W.	22 44 52	3948	24 10 4	3936	25 35 31	3925	27 1 11	3915
	Mars	W.	18 19 30	3463	19 40 36	3446	21 2 1	3432	22 23 41	3421

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Sun	E.	61° 36′ 10″	3457	60° 14′ 58″	3459	58° 53′ 48″	3462	57° 32′ 41″	3463
10	Spica	W.	97 4 29	3082	98 33 0	3082	100 1 32	3081	101 30 5	3079
	Antares	W.	51 10 36	3082	52 39 8	3081	54 7 41	3080	55 36 15	3078
	Jupiter	W.	28 27 2	3206	29 53 4	3198	31 19 16	3191	32 45 36	3183
	Mars	W.	23 45 34	3410	25 7 39	3401	26 29 54	3393	27 52 19	3385
	Sun	E.	50 47 22	3465	49 26 19	3463	48 5 14	3463	46 44 8	3461
11	Antares	W.	62 59 43	3065	64 28 35	3062	65 57 31	3058	67 26 32	3054
	Jupiter	W.	39 59 16	3153	41 26 22	3146	42 53 36	3140	44 20 57	3133
	Mars	W.	34 46 27	3351	36 9 39	3345	37 32 59	3338	38 56 26	3332
	Sun	E.	39 58 2	3447	38 36 39	3444	37 15 12	3439	35 53 40	3436
12	Antares	W.	74 52 57	3030	76 22 33	3025	77 52 15	3019	79 22 4	3014
	Jupiter	W.	51 39 39	3101	53 7 47	3094	54 36 4	3087	56 4 29	3080
	Mars	W.	45 55 35	3299	47 19 48	3291	48 44 10	3284	50 8 40	3277
	Sun	E.	29 4 48	3411	27 42 44	3406	26 20 34	3400	24 58 17	3394
16	Sun	W.	16 0 10	3163	17 27 3	3153	18 54 8	3143	20 21 26	3132
	Aldebaran	E.	56 47 43	2908	55 15 34	2903	53 43 19	2900	52 11 0	2897
	Pollux	E.	99 19 5	2800	97 44 37	2792	96 9 58	2783	94 35 8	2775
17	Sun	W.	27 41 2	3082	29 9 33	3073	30 38 15	3064	32 7 9	3054
	Aldebaran	E.	44 28 42	2892	42 56 13	2894	41 23 46	2897	39 51 23	2901
	Pollux	E.	86 38 13	2733	85 2 17	2725	83 26 10	2716	81 49 51	2707
18	Sun	W.	39 34 37	3006	41 4 42	2997	42 34 59	2987	44 5 28	2977
	Aldebaran	E.	32 11 38	2955	30 40 29	2977	29 9 47	3003	27 39 38	3036
	Pollux	E.	73 45 27	2665	72 8 0	2656	70 30 21	2647	68 52 30	2639
	Regulus	E.	110 37 58	2660	109 0 24	2652	107 22 39	2643	105 44 42	2633
19	Sun	W.	51 40 57	2928	53 12 40	2919	54 44 35	2909	56 16 43	2899
	Pollux	E.	60 40 20	2595	59 1 18	2586	57 22 4	2577	55 42 38	2568
	Regulus	E.	97 31 53	2589	95 52 43	2580	94 13 20	2570	92 33 44	2561
20	Sun	W.	64 0 34	2848	65 33 59	2838	67 7 38	2828	68 41 30	2817
	α Arietis	W.	28 6 11	2605	29 44 59	2587	31 24 12	2569	33 3 49	2554
	Pollux	E.	47 22 21	2594	45 41 41	2515	44 0 48	2506	42 19 43	2497
	Regulus	E.	84 12 35	2515	82 31 42	2505	80 50 36	2496	79 9 17	2486
21	Sun	W.	76 34 14	2765	78 9 28	2754	79 44 56	2744	81 20 38	2733
	α Arietis	W.	41 27 3	2484	43 8 39	2471	44 50 33	2458	46 32 45	2447
	Pollux	E.	33 51 11	2453	32 8 52	2445	30 26 22	2437	28 43 40	2430
	Regulus	E.	70 39 17	2438	68 56 36	2428	67 13 41	2417	65 30 31	2406
22	Sun	W.	89 22 39	2680	90 59 46	2670	92 37 6	2660	94 14 40	2649
	α Arietis	W.	55 7 53	2389	56 51 44	2378	58 35 50	2367	60 20 12	2357
	Aldebaran	W.	25 28 32	2782	27 3 23	2725	28 39 30	2675	30 16 44	2632
	Regulus	E.	56 51 14	2359	55 6 40	2349	53 21 52	2339	51 36 50	2330
	Spica	E.	110 51 43	2360	109 7 11	2350	107 22 25	2341	105 37 25	2331
23	Sun	W.	102 26 1	2599	104 4 58	2589	105 44 8	2580	107 23 31	2570
	α Arietis	W.	69 5 47	2306	70 51 38	2296	72 37 43	2287	74 24 1	2278

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Sun	E.	56° 11′ 35″	3464	54° 50′ 31″	3465	53° 29′ 28″	3465	52° 8′ 25″	3465
10	Spica	W.	102 58 40	3078	104 27 17	3075	105 55 57	3073	107 24 40	3069
	Antares	W.	57 4 51	3076	58 33 30	3074	60 2 11	3072	61 30 55	3069
	Jupiter	W.	34 12 5	3177	35 38 42	3171	37 5 26	3165	38 32 17	3158
	Mars	W.	29 14 53	3378	30 37 35	3371	32 0 25	3365	33 23 22	3358
	Sun	E.	45 23 0	3459	44 1 50	3456	42 40 37	3454	41 19 21	3451
11	Antares	W.	68 55 38	3050	70 24 49	3045	71 54 6	3041	73 23 28	3035
	Jupiter	W.	45 48 26	3127	47 16 3	3121	48 43 47	3114	50 11 39	3108
	Mars	W.	40 20 0	3325	41 43 42	3319	43 7 32	3312	44 31 30	3306
	Sun	E.	34 32 4	3431	33 10 23	3427	31 48 37	3422	30 26 45	3417
12	Antares	W.	80 52 0	3007	82 22 4	3001	83 52 15	2995	85 22 34	2988
	Jupiter	W.	57 33 3	3073	59 1 46	3066	60 30 37	3059	61 59 37	3052
	Mars	W.	51 33 18	3270	52 58 5	3263	54 23 0	3255	55 48 4	3247
	Sun	E.	23 35 54	3388	22 13 24	3383	20 50 48	3377	19 28 5	3371
16	Sun	W.	21 48 57	3122	23 16 40	3111	24 44 36	3102	26 12 43	3092
	Aldebaran	E.	50 38 37	2894	49 6 11	2893	47 33 43	2891	46 1 13	2891
	Pollux	E.	93 0 7	2766	91 24 55	2758	89 49 32	2750	88 13 58	2741
17	Sun	W.	33 36 15	3044	35 5 33	3035	36 35 2	3025	38 4 44	3016
	Aldebaran	E.	38 19 5	2907	36 46 55	2915	35 14 55	2925	33 43 8	2939
	Pollux	E.	80 13 21	2699	78 36 40	2690	76 59 47	2682	75 22 43	2673
18	Sun	W.	45 36 10	2968	47 7 3	2958	48 38 9	2948	50 9 27	2939
	Aldebaran	E.	26 10 10	3077	24 41 32	3129	23 13 57	3193	21 47 39	3275
	Pollux	E.	67 14 28	2630	65 36 14	2621	63 57 48	2612	62 19 10	2604
	Regulus	E.	104 6 32	2625	102 28 11	2615	100 49 37	2607	99 10 51	2598
19	Sun	W.	57 49 3	2889	59 21 36	2879	60 54 22	2869	62 27 21	2858
	Pollux	E.	54 2 59	2559	52 23 8	2551	50 43 5	2541	49 2 49	2533
	Regulus	E.	90 53 56	2553	89 13 55	2543	87 33 41	2533	85 53 14	2525
20	Sun	W.	70 15 36	2807	71 49 55	2796	73 24 28	2786	74 59 14	2775
	α Arietis	W.	34 43 47	2539	36 24 6	2524	38 4 46	2510	39 45 45	2497
	Pollux	E.	40 38 25	2488	38 56 55	2479	37 15 12	2470	35 33 17	2462
	Regulus	E.	77 27 44	2477	75 45 58	2467	74 3 58	2457	72 21 44	2448
21	Sun	W.	82 56 34	2722	84 32 44	2712	86 9 8	2701	87 45 46	2690
	α Arietis	W.	48 15 13	2435	49 57 58	2423	51 41 0	2412	53 24 18	2400
	Pollux	E.	27 0 48	2423	25 17 46	2416	23 34 34	2411	21 51 15	2407
	Regulus	E.	63 47 7	2398	62 3 29	2389	60 19 38	2379	58 35 33	2369
22	Sun	W.	95 52 29	2636	97 30 32	2629	99 8 48	2618	100 47 18	2609
	α Arietis	W.	62 4 49	2346	63 49 42	2336	65 34 49	2326	67 20 11	2316
	Aldebaran	W.	31 54 56	2593	33 34 0	2560	35 13 50	2530	36 54 22	2502
	Regulus	E.	49 51 34	2320	48 6 4	2311	46 20 20	2302	44 34 23	2292
	Spica	E.	103 52 10	2321	102 6 41	2312	100 20 59	2302	98 35 3	2293
23	Sun	W.	109 3 7	2561	110 42 55	2552	112 22 56	2543	114 3 9	2535
	α Arietis	W.	76 10 33	2269	77 57 18	2260	79 44 16	2252	81 31 26	2244

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Aldebaran	W.	38° 35′ 32″	2477	40° 17′ 17″	2455	41° 59′ 34″	2433	43° 42′ 21″	2414
	Regulus	E.	42 48 12	2283	41 1 48	2274	39 15 10	2265	37 28 19	2256
	Spica	E.	96 48 53	2284	95 2 30	2274	93 15 53	2266	91 29 3	2257
24	Sun	W.	115 43 33	2527	117 24 9	2519	119 4 56	2512	120 45 53	2504
	α Arietis	W.	83 18 48	2236	85 6 22	2229	86 54 7	2221	88 42 3	2214
	Aldebaran	W.	52 22 37	2335	54 7 45	2322	55 53 12	2311	57 38 56	2299
	Regulus	E.	28 30 58	2216	26 42 54	2209	24 54 40	2202	23 6 15	2195
	Spica	E.	82 31 45	2216	80 43 42	2208	78 55 27	2202	77 7 2	2194
25	Aldebaran	W.	66 31 24	2253	68 18 32	2247	70 5 50	2240	71 53 18	2235
	Pollux	W.	23 1 49	2194	24 50 26	2184	26 39 17	2177	28 28 19	2170
	Spica	E.	68 2 30	2165	66 13 10	2161	64 23 43	2156	62 34 9	2153
	Antares	E.	113 56 12	2164	112 6 50	2159	110 17 21	2155	108 27 45	2151
26	Aldebaran	W.	80 52 26	2215	82 40 31	2213	84 28 39	2212	86 16 48	2212
	Pollux	W.	37 35 32	2150	39 25 15	2147	41 15 2	2146	43 4 51	2145
	Spica	E.	53 25 6	2139	51 35 7	2138	49 45 6	2137	47 55 4	2136
	Antares	E.	99 18 30	2137	97 28 28	2137	95 38 25	2136	93 48 20	2136
27	Aldebaran	W.	95 17 25	2220	97 5 23	2223	98 53 16	2228	100 41 2	2233
	Pollux	W.	52 13 56	2150	54 3 39	2153	55 53 18	2156	57 42 52	2160
	Regulus	W.	15 18 5	2146	17 7 54	2149	18 57 39	2152	20 47 19	2155
	Spica	E.	38 45 14	2146	36 55 25	2149	35 5 41	2153	33 16 3	2158
	Antares	E.	84 38 9	2143	82 48 15	2145	80 58 25	2149	79 8 41	2153
	Jupiter	E.	109 21 4	2184	107 32 12	2186	105 43 24	2190	103 54 41	2193
28	Pollux	W.	66 48 55	2188	68 37 41	2196	70 26 15	2204	72 14 37	2212
	Regulus	W.	29 53 57	2184	31 42 49	2191	33 31 30	2199	35 19 59	2207
	Antares	E.	70 1 54	2182	68 13 0	2190	66 24 18	2198	64 35 48	2207
	Jupiter	E.	94 52 48	2221	93 4 52	2229	91 17 7	2237	89 29 34	2245
	Mars	E.	109 26 45	2389	107 42 54	2396	105 59 13	2404	104 15 44	2413
29	Pollux	W.	81 13 3	2262	82 59 59	2273	84 46 38	2285	86 33 0	2298
	Regulus	W.	44 19 1	2258	46 6 3	2268	47 52 49	2281	49 39 17	2294
	Antares	E.	55 36 45	2257	53 49 42	2269	52 2 57	2281	50 16 29	2294
	Jupiter	E.	80 35 14	2296	78 49 8	2307	77 3 19	2320	75 17 48	2332
	Mars	E.	95 41 42	2465	93 59 39	2477	92 17 53	2489	90 36 24	2502
	α Aquilæ	E.	106 45 49	3077	105 17 11	3073	103 48 29	3073	102 19 47	3075
30	Pollux	W.	95 20 3	2365	97 4 28	2380	98 48 32	2395	100 32 14	2410
	Regulus	W.	58 26 53	2361	60 11 24	2375	61 55 35	2390	63 39 24	2405
	Antares	E.	41 28 55	2361	39 44 24	2375	38 0 14	2390	36 16 25	2405
	Jupiter	E.	66 34 59	2401	64 51 26	2417	63 8 15	2432	61 25 26	2448
	Mars	E.	82 13 39	2572	80 34 5	2588	78 54 53	2603	77 16 2	2619
	α Aquilæ	E.	94 57 31	3110	93 29 33	3121	92 1 49	3134	90 34 21	3149
31	Pollux	W.	109 5 16	2489	110 46 45	2505	112 27 51	2522	114 8 33	2539
	Regulus	W.	72 13 1	2484	73 54 37	2499	75 35 51	2516	77 16 42	2533
	Antares	E.	27 42 53	2485	26 1 19	2501	24 20 7	2518	22 39 19	2535
	Jupiter	E.	52 57 4	2532	51 16 35	2549	49 36 30	2567	47 56 50	2585
	Mars	E.	69 7 17	2702	67 30 40	2719	65 54 25	2736	64 18 33	2753
	α Aquilæ	E.	83 21 57	3942	81 56 38	3965	80 31 45	3988	79 7 20	3314

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Aldebaran	W.	45 25 36	2396	47 9 16	2379	48 53 21	2363	50 37 49	2349
	Regulus	E.	35 41 15	2248	33 53 59	2240	32 6 31	2232	30 18 51	2223
	Spica	E.	89 42 0	2249	87 57 45	2240	86 7 17	2232	84 19 37	2224
24	Sun	W.	122 27 0	2498	124 8 16	2491	125 49 42	2485	127 31 16	2479
	α Arietis	W.	90 30 10	2207	92 18 27	2202	94 6 52	2196	95 55 26	2190
	Aldebaran	W.	59 24 57	2289	61 11 13	2279	62 57 44	2270	64 44 28	2262
	Regulus	E.	21 17 40	2189	19 28 56	2183	17 40 3	2178	15 51 2	2173
	Spica	E.	75 18 26	2188	73 29 41	2182	71 40 46	2176	69 51 42	2170
25	Aldebaran	W.	73 40 54	2229	75 28 38	2225	77 16 29	2221	79 4 25	2218
	Pollux	W.	30 17 31	2165	32 6 51	2160	33 56 19	2156	35 45 53	2153
	Spica	E.	60 44 30	2149	58 54 45	2146	57 4 56	2143	55 15 3	2141
	Antares	E.	106 38 4	2147	104 48 17	2144	102 58 25	2141	101 8 29	2139
26	Aldebaran	W.	88 4 58	2212	89 53 8	2213	91 41 16	2214	93 29 22	2216
	Pollux	W.	44 54 41	2145	46 44 31	2145	48 34 21	2146	50 24 10	2148
	Spica	E.	46 5 3	2139	44 15 3	2139	42 25 4	2141	40 35 7	2143
	Antares	E.	91 58 15	2136	90 8 11	2137	88 18 8	2138	86 28 7	2140
27	Aldebaran	W.	102 28 41	2239	104 16 11	2245	106 3 31	2253	107 50 40	2260
	Pollux	W.	59 32 20	2165	61 21 41	2169	63 10 55	2175	65 0 0	2182
	Regulus	W.	22 36 54	2160	24 26 22	2165	26 15 43	2170	28 4 55	2177
	Spica	E.	31 26 32	2163	29 37 9	2169	27 47 55	2176	25 58 51	2183
	Antares	E.	77 19 3	2159	75 29 33	2164	73 40 11	2170	71 50 58	2176
	Jupiter	E.	102 6 3	2198	100 17 32	2203	98 29 9	2208	96 40 54	2214
28	Pollux	W.	74 2 47	2221	75 50 43	2231	77 38 25	2241	79 25 52	2252
	Regulus	W.	37 8 16	2216	38 56 19	2226	40 44 8	2236	42 31 42	2246
	Antares	E.	62 47 31	2216	60 59 27	2226	59 11 38	2236	57 24 4	2246
	Jupiter	E.	87 42 14	2254	85 55 7	2264	84 8 14	2274	82 21 36	2285
	Mars	E.	102 32 28	2422	100 49 25	2432	99 6 36	2442	97 24 1	2453
29	Pollux	W.	88 19 3	2311	90 4 47	2324	91 50 12	2337	93 35 18	2351
	Regulus	W.	51 25 26	2306	53 11 17	2319	54 56 49	2333	56 42 1	2346
	Antares	E.	48 30 20	2306	46 44 29	2320	44 58 58	2333	43 13 46	2347
	Jupiter	E.	73 32 35	2345	71 47 41	2359	70 3 7	2373	68 18 53	2387
	Mars	E.	88 55 13	2515	87 14 20	2529	85 33 47	2543	83 53 33	2557
	α Aquilæ	E.	100 51 7	3078	99 22 31	3084	97 54 2	3091	96 25 41	3100
30	Pollux	W.	102 15 35	2425	103 58 34	2441	105 41 10	2457	107 23 24	2472
	Regulus	W.	65 22 52	2420	67 5 58	2436	68 48 41	2452	70 31 2	2467
	Antares	E.	34 32 58	2421	32 49 53	2436	31 7 10	2453	29 24 50	2469
	Jupiter	E.	59 42 59	2464	58 0 55	2481	56 19 15	2497	54 37 58	2514
	Mars	E.	75 37 33	2635	73 59 25	2652	72 21 40	2668	70 44 17	2685
	α Aquilæ	E.	89 7 11	3165	87 40 20	3182	86 13 49	3201	84 47 41	3221
31	Pollux	W.	115 48 52	2555	117 28 49	2572	119 8 22	2589	120 47 32	2606
	Regulus	W.	78 57 9	2550	80 37 13	2566	82 16 55	2583	83 56 14	2599
	Antares	E.	20 58 54	2551	19 18 52	2569	17 39 14	2586	16 0 0	2603
	Jupiter	E.	46 17 43	2604	44 38 44	2622	43 0 19	2641	41 22 20	2660
	Mars	E.	62 43 4	2771	61 7 58	2788	59 33 15	2806	57 58 55	2825
	α Aquilæ	E.	77 43 25	3340	76 20 0	3369	74 57 8	3398	73 34 49	3428

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be added to* / *subtracted from* *Apparent Time.*	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sun.	1	0 43 40.18	9.097	N. 4 41 53.4	+57.74	16 1.98	64.51	3 51.87	0.757
Mon.	2	0 47 18.56	9.102	5 4 56.7	57.53	16 1.70	64.53	3 33.74	0.752
Tues.	3	0 50 57.08	9.109	5 27 54.6	57.30	16 1.42	64.55	3 15.75	0.745
Wed.	4	0 54 35.77	9.116	5 50 47.1	57.06	16 1.14	64.57	2 57.93	0.738
Thur.	5	0 58 14.63	9.124	6 13 33.5	56.80	16 0.86	64.60	2 40.29	0.730
Frid.	6	1 1 53.70	9.133	6 36 13.7	56.53	16 0.57	64.63	2 22.86	0.721
Sat.	7	1 5 33.01	9.143	6 58 47.3	56.25	16 0.29	64.66	2 5.66	0.711
Sun.	8	1 9 12.56	9.153	7 21 13.8	55.95	16 0.01	64.69	1 48.71	0.701
Mon.	9	1 12 52.38	9.164	7 43 33.1	55.64	15 59.73	64.73	1 32.02	0.690
Tues.	10	1 16 32.47	9.175	8 5 44.6	55.31	15 59.46	64.77	1 15.60	0.679
Wed.	11	1 20 12.84	9.188	8 27 48.1	54.97	15 59.18	64.81	0 59.46	0.666
Thur.	12	1 23 53.52	9.201	8 49 43.0	54.61	15 58.91	64.86	0 43.63	0.653
Frid.	13	1 27 34.52	9.214	9 11 29.2	54.24	15 58.64	64.91	0 28.11	0.640
Sat.	14	1 31 15.84	9.228	9 33 6.4	53.85	15 58.37	64.96	0 12.92	0.626
Sun.	15	1 34 57.49	9.242	9 54 34.0	53.44	15 58.10	65.01	0 1.94	0.612
Mon.	16	1 38 39.50	9.257	10 15 51.5	53.02	15 57.84	65.07	0 16.45	0.597
Tues.	17	1 42 21.87	9.274	10 36 58.8	52.59	15 57.58	65.12	0 30.59	0.581
Wed.	18	1 46 4.62	9.290	10 57 55.7	52.14	15 57.32	65.18	0 44 35	0.565
Thur.	19	1 49 47.76	9.306	11 18 41.6	51.68	15 57.06	65.24	0 57.73	0.549
Frid.	20	1 53 31.30	9.322	11 39 16.2	51.20	15 56.81	65.30	1 10.71	0.533
Sat.	21	1 57 15.25	9.340	11 59 39.2	50.71	15 56.56	65.36	1 23.28	0.515
Sun.	22	2 0 59.62	9.358	12 19 50.4	50.20	15 56.31	65.43	1 35.43	0.497
Mon.	23	2 4 44.44	9.377	12 39 49.2	49.69	15 56.06	65.50	1 47.14	0.478
Tues.	24	2 8 29.71	9.396	12 59 35.6	49.16	15 55.81	65.57	1 58.39	0.459
Wed.	25	2 12 15.44	9.416	13 19 9.4	48.62	15 55.56	65.64	2 9.18	0.439
Thur.	26	2 16 1.66	9.436	13 38 29.8	48.07	15 55.32	65.71	2 19.49	0.419
Frid.	27	2 19 48.37	9.457	13 57 36.8	47.52	15 55.07	65.78	2 29.31	0.398
Sat.	28	2 23 35.57	9.478	14 16 30.2	46.94	15 54.83	65.86	2 38.63	0.377
Sun.	29	2 27 23.30	9.500	14 35 9.5	46.35	15 54.59	65.93	2 47.44	0.355
Mon.	30	2 31 11.57	9.522	14 53 34.5	45.74	15 54.35	66.01	2 55.71	0.333
Tues.	31	2 35 0.38	9.545	N.15 11 44.9	+45.12	15 54.11	66.09	3 3.43	0.310

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, *to be subtracted from*		Sidereal Time or Right Ascension of *Mean* Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	*added to Mean Time.*	Diff. for 1 hour.	
		h m s	s	° ′ ″	″	m s	s	h m s
Sun.	1	0 43 39.58	9.099	N. 4 41 49.6	+57.75	3 51.92	0.757	0 39 47.67
Mon.	2	0 47 18.00	9.104	5 4 53.2	57.54	3 33.78	0.752	0 43 44.22
Tues.	3	0 50 56.57	9.110	5 27 51.4	57.31	3 15.79	0.745	0 47 40.78
Wed.	4	0 54 35.30	9.118	5 50 44.2	57.07	2 57.97	0.738	0 51 37.33
Thur.	5	0 58 14.21	9.126	6 13 30.9	56.81	2 40.32	0.730	0 55 33.89
Frid.	6	1 1 53.33	9.135	6 36 11.4	56.54	2 22.89	0.721	0 59 30.44
Sat.	7	1 5 32.68	9.145	6 58 45.3	56.26	2 5.69	0.711	1 3 26.99
Sun.	8	1 9 12.28	9.155	7 21 12.1	55.96	1 48.74	0.701	1 7 23.54
Mon.	9	1 12 52.14	9.166	7 43 31.6	55.65	1 32.04	0.690	1 11 20.10
Tues.	10	1 16 32.27	9.177	8 5 43.4	55.32	1 15.62	0.679	1 15 16.65
Wed.	11	1 20 12.68	9.190	8 27 47.1	54.98	0 59.47	0.666	1 19 13.21
Thur.	12	1 23 53.40	9.203	8 49 42.3	54.62	0 43.64	0.653	1 23 9.76
Frid.	13	1 27 34.44	9.216	9 11 28.8	54.25	0 28.12	0.640	1 27 6.32
Sat.	14	1 31 15.80	9.230	9 33 6.1	53.86	0 12.93	0.626	1 31 2.87
Sun.	15	1 34 57.49	9.244	9 54 33.9	53.45	0 1.94	0.612	1 34 59.43
Mon.	16	1 38 39.53	9.259	10 15 51.7	53.03	0 16.45	0.597	1 38 55.98
Tues.	17	1 42 21.94	9.275	10 36 59.3	52.60	0 30.60	0.581	1 42 52.54
Wed.	18	1 46 4.73	9.291	10 57 56.3	52.15	0 44.36	0.565	1 46 49.09
Thur.	19	1 49 47.91	9.307	11 18 42.4	51.69	0 57.74	0.549	1 50 45.65
Frid.	20	1 53 31.48	9.323	11 39 17.2	51.21	1 10.72	0.533	1 54 42.20
Sat.	21	1 57 15.46	9.341	11 59 40.4	50.72	1 23.30	0.515	1 58 38.76
Sun.	22	2 0 59.87	9.359	12 19 51.7	50.21	1 35.44	0.497	2 2 35.31
Mon.	23	2 4 44.72	9.378	12 39 50.7	49.70	1 47.15	0.478	2 6 31.87
Tues.	24	2 8 30.02	9.397	12 59 37.3	49.17	1 58.40	0.459	2 10 28.42
Wed.	25	2 12 15.78	9.417	13 19 11.1	48.63	2 9.20	0.439	2 14 24.98
Thur.	26	2 16 2.03	9.437	13 38 31.7	48.08	2 19.50	0.419	2 18 21.53
Frid.	27	2 19 48.76	9.458	13 57 38.8	47.52	2 29.33	0.398	2 22 18.09
Sat.	28	2 23 35.99	9.479	14 16 32.3	46.94	2 38.65	0.377	2 26 14.64
Sun.	29	2 27 23.74	9.501	14 35 11.8	46.35	2 47.46	0.355	2 30 11.20
Mon.	30	2 31 12.03	9.523	14 53 36.8	45.74	2 55.72	0.333	2 34 7.75
Tues.	31	2 35 0.86	9.546	N. 15 11 47.2	+45.12	3 3.45	0.310	2 38 4.31

Note.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^s.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True LONGITUDE. λ	THE SUN'S True LONGITUDE. λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
1	91	11° 52′ 37″.5	52′ 19″.5	147″.76	−0″.41	0.0000105	+52.8	23ʰ 16ᵐ 22ˢ.95
2	92	12 51 42.9	51 24.8	147.69	0.43	.0001378	53.0	23 12 27.04
3	93	13 50 46.5	50 28.3	147.62	0.43	.0002654	53.1	23 8 31.12
4	94	14 49 48.4	49 30.0	147.54	0.40	.0003931	53.2	23 4 35.22
5	95	15 48 48.5	48 30.0	147.47	0.34	.0005207	53.1	23 0 39.31
6	96	16 47 46.9	47 28.3	147.40	0.26	.0006481	53.0	22 56 43.40
7	97	17 46 43.5	46 24.8	147.33	0.14	.0007751	52.8	22 52 47.49
8	98	18 45 38.3	45 19.5	147.25	−0.02	.0009016	52.6	22 48 51.58
9	99	19 44 31.4	44 12.5	147.18	+0.11	.0010275	52.3	22 44 55.68
10	100	20 43 22.7	43 3.6	147.10	0.25	.0011528	52.0	22 40 59.77
11	101	21 42 12.1	41 52.9	147.02	0.39	.0012772	51.6	22 37 3.86
12	102	22 40 59.6	40 40.3	146.94	0.52	.0014006	51.2	22 23 7.95
13	103	23 39 45.1	39 25.7	146.86	0.63	.0015228	50.7	22 29 12.05
14	104	24 38 28.6	38 9.1	146.77	0.70	.0016438	50.2	22 25 16.14
15	105	25 37 10.1	36 50.4	146.69	0.76	.0017637	49.8	22 21 20.23
16	106	26 35 49.5	35 29.7	146.60	0.78	.0018825	49.3	22 17 24.32
17	107	27 34 26.8	34 6.9	146.51	0.78	.0020002	48.9	22 13 28.41
18	108	28 33 1.9	32 41.9	146.42	0.74	.0021169	48.4	22 9 32.50
19	109	29 31 34.9	31 14.7	146.33	0.68	.0022327	48.0	22 5 36.59
20	110	30 30 5.7	29 45.3	146.24	0.59	.0023476	47.7	22 1 40.68
21	111	31 28 34.2	28 13.7	146.15	0.49	.0024617	47.4	21 57 44.77
22	112	32 27 0.6	26 40.0	146.06	0.37	.0025752	47.1	21 53 48.86
23	113	33 25 24.9	25 4.2	145.97	0.24	.0026881	46.9	21 49 52.95
24	114	34 23 47.1	23 26.2	145.88	+0.11	.0028005	46.7	21 45 57.04
25	115	35 22 7.2	21 46.2	145.80	−0.02	.0029124	46.5	21 42 1.14
26	116	36 20 25.4	20 4.2	145.72	0.12	.0030239	46.4	21 38 5.23
27	117	37 18 41.7	18 20.4	145.64	0.21	.0031351	46.2	21 34 9.32
28	118	38 16 56.3	16 34.8	145.57	0.28	.0032458	46.0	21 30 13.41
29	119	39 15 9.1	14 47.5	145.50	0.33	.0033562	45.8	21 26 17.50
30	120	40 13 20.2	12 58.4	145.43	0.34	.0034662	45.7	21 22 21.59
31	121	41 11 29.7	11 7.8	145.36	−0.30	0.0035756	+45.4	21 18 25.68

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
−9ˢ.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 34.7	15 28.0	57 3.7	−2.05	56 39.4	−1.99	15 12.6	2.25	17.4
2	15 21.7	15 15.6	56 16.0	1.91	55 53.8	1.79	16 6.8	2.27	18.4
3	15 10.0	15 5.0	55 33.2	1.64	55 14.6	1.47	17 1.0	2.23	19.4
4	15 0.5	14 56.6	54 58.1	1.28	54 43.9	1.08	17 53.6	2.14	20.4
5	14 53.5	14 51.0	54 32.2	0.87	54 23.0	0.66	18 43.7	2.03	21.4
6	14 49.2	14 48.1	54 16.5	−0.43	54 12.7	−0.21	19 31.0	1.90	22.4
7	14 47.8	14 48.1	54 11.4	0.00	54 12.6	+0.20	20 15.4	1.80	23.4
8	14 49.1	14 50.7	54 16.2	+0.39	54 22.0	0.57	20 57.7	1.73	24.4
9	14 52.9	14 55.5	54 29.9	0.74	54 39.7	0.89	21 38.7	1.69	25.4
10	14 58.6	15 2.1	54 51.1	1.02	55 4.0	1.13	22 19.3	1.70	26.4
11	15 6.0	15 10.0	55 18.1	1.22	55 33.2	1.29	23 0.6	1.76	27.4
12	15 14.3	15 18.7	55 49.0	1.34	56 5.2	1.37	23 43.9	1.86	28.4
13	15 23.2	15 27.7	56 21.7	1.37	56 38.1	1.36	6		29.4
14	15 32.1	15 36.4	56 54.3	1.34	57 10.1	1.29	0 30.2	2.01	0.8
15	15 40.5	15 44.5	57 25.3	1.24	57 39.8	1.18	1 20.6	2.19	1.8
16	15 48.2	15 51.7	57 53.5	1.10	58 6.3	0.03	2 15.5	2.37	2.8
17	15 55.0	15 58.0	58 18.3	0.96	58 29.4	0.88	3 14.4	2.52	3.8
18	16 0.8	16 3.3	58 39.5	0.81	58 48.7	0.73	4 15.8	2.57	4.8
19	16 5.5	16 7.5	58 57.0	0.65	59 4.3	0.57	5 17.1	2.52	5.8
20	16 9.2	16 10.6	59 10.6	0.48	59 15.8	0.39	6 16.1	2.38	6.8
21	16 11.7	16 12.5	59 19.8	0.29	59 22.6	+0.17	7 11.5	2.23	7.8
22	16 12.9	16 12.8	59 23.9	+0.05	59 23.7	−0.08	8 3.5	2.10	8.8
23	16 12.3	16 11.3	59 21.9	−0.22	59 18.3	0.38	8 52.7	2.01	9.8
24	16 9.8	16 7.7	59 12.7	0.55	59 5.1	0.72	9 40.4	1.98	10.8
25	16 5.1	16 2.0	58 55.5	1.88	58 43.9	1.04	10 28.0	2.00	11.8
26	15 58.3	15 54.2	58 30.5	1.19	58 15.3	1.33	11 16.6	2.06	12.8
27	15 49.6	15 44.7	57 58.5	1.46	57 40.5	1.55	12 7.0	2.15	13.8
28	15 39.5	15 34.1	57 21.4	1.62	57 1.7	1.66	12 59.7	2.24	14.8
29	15 28.7	15 23.3	56 41.7	1.67	56 21.8	1.65	13 54.1	2.29	15.8
30	15 18.0	15 12.9	56 2.3	1.60	55 43.6	1.52	14 49.2	2.29	16.8
31	15 8.1	15 3.7	55 26.0	−1.41	55 9.9	−1.27	15 43.4	2.22	17.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 19 39.82	2.2962	S. 23 31 53.9	9.289
1	15 21 57.67	2.2987	23 41 7.1	9.151
2	15 24 15.66	2.3011	23 50 12.0	9.012
3	15 26 33.80	2.3035	23 59 8.5	8.872
4	15 28 52.08	2.3058	24 7 56.6	8.731
5	15 31 10.50	2.3081	24 16 36.2	8.588
6	15 33 29.05	2.3103	24 25 7.2	8.446
7	15 35 47.74	2.3126	24 33 29.7	8.303
8	15 38 6.56	2.3148	24 41 43.6	8.161
9	15 40 25.51	2.3168	24 49 49.0	8.018
10	15 42 44.58	2.3188	24 57 45.7	7.873
11	15 45 3.77	2.3209	25 5 33.7	7.728
12	15 47 23.09	2.3229	25 13 13.0	7.583
13	15 49 42.52	2.3247	25 20 43.6	7.437
14	15 52 2.06	2.3265	25 28 5.4	7.289
15	15 54 21.70	2.3283	25 35 18.3	7.142
16	15 56 41.45	2.3300	25 42 22.4	6.995
17	15 59 1.30	2.3317	25 49 17.7	6.847
18	16 1 21.25	2.3333	25 56 4.1	6.699
19	16 3 41.29	2.3348	26 2 41.6	6.550
20	16 6 1.42	2.3363	26 9 10.1	6.401
21	16 8 21.64	2.3377	26 15 29.7	6.252
22	16 10 41.94	2.3389	26 21 40.3	6.102
23	16 13 2.31	2.3401	S. 26 27 41.9	5.951

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 15 22.75	2.3413	S. 26 33 34.4	5.800
1	16 17 43.26	2.3424	26 39 17.9	5.650
2	16 20 3.84	2.3434	26 44 52.4	5.499
3	16 22 24.47	2.3443	26 50 17.8	5.348
4	16 24 45.16	2.3452	26 55 34.2	5.197
5	16 27 5.90	2.3460	27 0 41.4	5.044
6	16 29 26.68	2.3467	27 5 39.5	4.892
7	16 31 47.50	2.3473	27 10 28.5	4.741
8	16 34 8.36	2.3479	27 15 8.4	4.588
9	16 36 29.25	2.3483	27 19 39.1	4.436
10	16 38 50.16	2.3487	27 24 0.7	4.283
11	16 41 11.10	2.3491	27 28 13.1	4.130
12	16 43 32.05	2.3493	27 32 16.3	3.977
13	16 45 53.01	2.3494	27 36 10.4	3.825
14	16 48 13.98	2.3494	27 39 55.3	3.672
15	16 50 34.94	2.3493	27 43 31.0	3.519
16	16 52 55.90	2.3492	27 46 57.6	3.367
17	16 55 16.85	2.3490	27 50 15.0	3.213
18	16 57 37.78	2.3487	27 53 23.2	3.061
19	16 59 58.69	2.3483	27 56 22.3	2.908
20	17 2 19.58	2.3478	27 59 12.2	2.756
21	17 4 40.43	2.3472	28 1 53.0	2.603
22	17 7 1.24	2.3466	28 4 24.6	2.451
23	17 9 22.02	2.3459	28 6 47.1	2.298
24	17 11 42.75	2.3450	S. 28 9 0.4	2.146

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 11 42.75	2.3450	S. 28 9 0.4	2.146
1	17 14 3.42	2.3441	28 11 4.6	1.994
2	17 16 24.04	2.3431	28 12 59.7	1.842
3	17 18 44.59	2.3419	28 14 45.7	1.691
4	17 21 5.07	2.3408	28 16 22.6	1.539
5	17 23 25.48	2.3396	28 17 50.4	1.388
6	17 25 45.82	2.3383	28 19 9.2	1.237
7	17 28 6.07	2.3368	28 20 18.9	1.087
8	17 30 26.23	2.3352	28 21 19.6	0.937
9	17 32 46.29	2.3335	28 22 11.3	0.787
10	17 35 6.25	2.3318	28 22 54.0	0.637
11	17 37 26.11	2.3300	28 23 27.8	0.488
12	17 39 45.85	2.3281	28 23 52.6	0.338
13	17 42 5.48	2.3262	28 24 8.4	0.190
14	17 44 24.99	2.3241	28 24 15.4	−0.042
15	17 46 44.37	2.3219	28 24 13.5	+0.106
16	17 49 3.62	2.3197	28 24 2.7	0.253
17	17 51 22.74	2.3175	28 23 43.1	0.401
18	17 53 41.72	2.3151	28 23 14.6	0.547
19	17 56 0.55	2.3126	28 22 37.4	0.693
20	17 58 19.23	2.3101	28 21 51.4	0.839
21	18 0 37.76	2.3075	28 20 56.7	0.984
22	18 2 56.13	2.3047	28 19 53.3	1.128
23	18 5 14.33	2.3019	S. 28 18 41.3	1.273

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 7 32.36	2.2991	S. 28 17 20.6	1.417
1	18 9 50.22	2.2962	28 15 51.3	1.559
2	18 12 7.90	2.2932	28 14 13.5	1.702
3	18 14 25.40	2.2901	28 12 27.1	1.844
4	18 16 42.71	2.2870	28 10 32.2	1.985
5	18 18 59.84	2.2838	28 8 28.9	2.126
6	18 21 16.77	2.2805	28 6 17.1	2.267
7	18 23 33.50	2.2772	28 3 56.9	2.406
8	18 25 50.03	2.2738	28 1 28.4	2.544
9	18 28 6.35	2.2703	27 58 51.6	2.682
10	18 30 22.46	2.2668	27 56 6.5	2.820
11	18 32 38.36	2.2633	27 53 13.2	2.957
12	18 34 54.05	2.2596	27 50 11.7	3.093
13	18 37 9.51	2.2558	27 47 2.0	3.229
14	18 39 24.75	2.2521	27 43 44.2	3.364
15	18 41 39.76	2.2482	27 40 18.3	3.498
16	18 43 54.54	2.2443	27 36 44.4	3.630
17	18 46 9.08	2.2404	27 33 2.5	3.764
18	18 48 23.39	2.2365	27 29 12.7	3.896
19	18 50 37.46	2.2324	27 25 15.0	4.027
20	18 52 51.28	2.2283	27 21 9.4	4.158
21	18 55 4.86	2.2242	27 16 56.0	4.288
22	18 57 18.19	2.2201	27 12 34.8	4.417
23	18 59 31.27	2.2159	27 8 5.9	4.546
24	19 1 44.10	2.2117	S. 27 3 29.3	4.673

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 1 44.10	2.2117	S. 27 3 29.3	4.673
1	19 3 56.67	2.2073	26 58 45.1	4.800
2	19 6 8.98	2.2031	26 53 53.3	4.927
3	19 8 21.04	2.1988	26 48 53.9	5.053
4	19 10 32.84	2.1944	26 43 47.0	5.177
5	19 12 44.37	2.1899	26 38 32.7	5.299
6	19 14 55.63	2.1854	26 33 11.1	5.422
7	19 17 6.62	2.1810	26 27 42.1	5.544
8	19 19 17.35	2.1766	26 22 5.8	5.666
9	19 21 27.81	2.1721	26 16 22.2	5.787
10	19 23 38.00	2.1675	26 10 31.4	5.906
11	19 25 47.91	2.1629	26 4 33.5	6.025
12	19 27 57.55	2.1583	25 58 28.4	6.143
13	19 30 6.91	2.1538	25 52 16.3	6.260
14	19 32 16.00	2.1492	25 45 57.2	6.377
15	19 34 24.81	2.1445	25 39 31.1	6.492
16	19 36 33.34	2.1398	25 32 58.1	6.607
17	19 38 41.59	2.1352	25 26 18.3	6.721
18	19 40 49.56	2.1305	25 19 31.6	6.834
19	19 42 57.25	2.1258	25 12 38.2	6.946
20	19 45 4.66	2.1211	25 5 38.1	7.057
21	19 47 11.78	2.1163	24 58 31.3	7.168
22	19 49 18.62	2.1117	24 51 17.9	7.278
23	19 51 25.18	2.1071	S. 24 43 57.9	7.387

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 53 31.47	2.1024	S. 24 36 31.4	7.495
1	19 55 37.47	2.0977	24 28 58.5	7.602
2	19 57 43.19	2.0929	24 21 19.1	7.709
3	19 59 48.62	2.0882	24 13 33.4	7.814
4	20 1 53.77	2.0835	24 5 41.4	7.919
5	20 3 58.64	2.0789	23 57 43.1	8.023
6	20 6 3.24	2.0743	23 49 38.6	8.127
7	20 8 7.56	2.0696	23 41 27.9	8.229
8	20 10 11.59	2.0648	23 33 11.1	8.330
9	20 12 15.34	2.0602	23 24 48.3	8.430
10	20 14 18.81	2.0556	23 16 19.5	8.530
11	20 16 22.01	2.0510	23 7 44.7	8.629
12	20 18 24.93	2.0464	22 59 4.0	8.727
13	20 20 27.58	2.0418	22 50 17.5	8.824
14	20 22 29.95	2.0372	22 41 25.1	8.922
15	20 24 32.04	2.0326	22 32 26.9	9.018
16	20 26 33.86	2.0282	22 23 23.0	9.112
17	20 28 35.42	2.0237	22 14 13.5	9.205
18	20 30 36.71	2.0192	22 4 58.4	9.298
19	20 32 37.73	2.0147	21 55 37.7	9.391
20	20 34 38.48	2.0102	21 46 11.5	9.482
21	20 36 38.96	2.0058	21 36 39.9	9.572
22	20 38 39.18	2.0015	21 27 2.9	9.663
23	20 40 39.14	1.9972	21 17 20.4	9.753
24	20 42 38.84	1.9928	S. 21 7 32.6	9.841

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 42 38.84	1.9928	S. 21 7 32.6	9.841
1	20 44 38.28	1.9886	20 57 39.5	9.927
2	20 46 37.47	1.9843	20 47 41.3	10.013
3	20 48 36.40	1.9801	20 37 37.9	10.099
4	20 50 35.08	1.9759	20 27 29.4	10.184
5	20 52 33.51	1.9717	20 17 15.8	10.269
6	20 54 31.68	1.9675	20 6 57.1	10.352
7	20 56 29.61	1.9635	19 56 33.5	10.434
8	20 58 27.30	1.9595	19 46 5.0	10.517
9	21 0 24.75	1.9555	19 35 31.5	10.598
10	21 2 21.96	1.9516	19 24 53.2	10.678
11	21 4 18.94	1.9477	19 14 10.2	10.757
12	21 6 15.68	1.9438	19 3 22.4	10.836
13	21 8 12.19	1.9399	18 52 29.9	10.913
14	21 10 8.47	1.9361	18 41 32.8	10.990
15	21 12 4.52	1.9323	18 30 31.1	11.067
16	21 14 0.34	1.9286	18 19 24.8	11.143
17	21 15 55.95	1.9250	18 8 14.0	11.218
18	21 17 51.34	1.9213	17 56 58.7	11.292
19	21 19 46.51	1.9177	17 45 39.0	11.364
20	21 21 41.47	1.9142	17 34 15.0	11.437
21	21 23 36.22	1.9107	17 22 46.6	11.508
22	21 25 30.76	1.9073	17 11 14.0	11.578
23	21 27 25.10	1.9039	S. 16 59 37.2	11.649

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 29 19.23	1.9006	S. 16 47 56.1	11.719
1	21 31 13.17	1.8973	16 36 10.9	11.787
2	21 33 6.91	1.8941	16 24 21.6	11.855
3	21 35 0.46	1.8909	16 12 28.3	11.922
4	21 36 53.82	1.8878	16 0 31.0	11.988
5	21 38 47.00	1.8847	15 48 29.7	12.054
6	21 40 39.99	1.8817	15 36 24.5	12.118
7	21 42 32.80	1.8787	15 24 15.5	12.183
8	21 44 25.44	1.8758	15 12 2.6	12.247
9	21 46 17.90	1.8729	14 59 45.9	12.309
10	21 48 10.19	1.8702	14 47 25.5	12.371
11	21 50 2.32	1.8675	14 35 1.4	12.432
12	21 51 54.29	1.8648	14 22 33.7	12.492
13	21 53 46.09	1.8621	14 10 2.4	12.552
14	21 55 37.74	1.8596	13 57 27.5	12.611
15	21 57 29.24	1.8571	13 44 49.1	12.669
16	21 59 20.59	1.8546	13 32 7.2	12.727
17	22 1 11.79	1.8522	13 19 21.9	12.783
18	22 3 2.85	1.8498	13 6 33.3	12.838
19	22 4 53.77	1.8476	12 53 41.4	12.893
20	22 6 44.56	1.8453	12 40 46.1	12.949
21	22 8 35.21	1.8432	12 27 47.5	13.003
22	22 10 25.74	1.8412	12 14 45.7	13.056
23	22 12 16.15	1.8391	12 1 40.8	13.108
24	22 14 6.43	1.8370	S. 11 48 32.8	13.159

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 14 6.43	1.8370	S. 11 48 32.8	13.159	0	23 41 14.81	1.8200	S. 0 31 50.1	14.738
1	22 15 56.59	1.8352	11 35 21.7	13.210	1	23 43 4.05	1.8214	0 17 5.4	14.752
2	22 17 46.65	1.8334	11 22 7.6	13.260	2	23 44 53.38	1.8228	S. 0 2 19.9	14.764
3	22 19 36.60	1.8316	11 8 50.5	13.309	3	23 46 42.79	1.8243	N. 0 12 26.3	14.775
4	22 21 26.44	1.8298	10 55 30.5	13.358	4	23 48 32.30	1.8260	0 27 13.1	14.786
5	22 23 16.17	1.8281	10 42 7.6	13.406	5	23 50 21.91	1.8276	0 42 0.6	14.796
6	22 25 5.81	1.8265	10 28 41.8	13.453	6	23 52 11.61	1.8293	0 56 48.6	14.804
7	22 26 55.35	1.8249	10 15 13.2	13.499	7	23 54 1.42	1.8311	1 11 37.1	14.812
8	22 28 44.80	1.8235	10 1 41.9	13.544	8	23 55 51.34	1.8330	1 26 26.0	14.818
9	22 30 34.17	1.8221	9 48 7.9	13.589	9	23 57 41.38	1.8350	1 41 15.3	14.824
10	22 32 23.45	1.8208	9 34 31.2	13.633	10	23 59 31.54	1.8370	1 56 4.9	14.829
11	22 34 12.66	1.8195	9 20 51.9	13.678	11	0 1 21.82	1.8391	2 10 54.8	14.834
12	22 36 1.79	1.8182	9 7 9.9	13.721	12	0 3 12.23	1.8413	2 25 45.0	14.837
13	22 37 50.85	1.8171	8 53 25.4	13.762	13	0 5 2.77	1.8435	2 40 35.3	14.839
14	22 39 39.84	1.8160	8 39 38.5	13.803	14	0 6 53.45	1.8458	2 55 25.7	14.840
15	22 41 28.77	1.8150	8 25 49.1	13.843	15	0 8 44.27	1.8482	3 10 16.1	14.840
16	22 43 17.64	1.8141	8 11 57.3	13.882	16	0 10 35.23	1.8507	3 25 6.5	14.840
17	22 45 6.46	1.8132	7 58 3.2	13.921	17	0 12 26.35	1.8532	3 39 56.9	14.838
18	22 46 55.22	1.8123	7 44 6.8	13.959	18	0 14 17.62	1.8558	3 54 47.1	14.835
19	22 48 43.94	1.8116	7 30 8.1	13.997	19	0 16 9.05	1.8585	4 9 37.1	14.832
20	22 50 32.61	1.8108	7 16 7.2	14.034	20	0 18 0.64	1.8613	4 24 26.9	14.827
21	22 52 21.24	1.8102	7 2 4.1	14.070	21	0 19 52.40	1.8642	4 39 16.3	14.821
22	22 54 9.84	1.8097	6 47 58.8	14.105	22	0 21 44.34	1.8671	4 54 5.4	14.814
23	22 55 58.41	1.8092	S. 6 33 51.5	14.138	23	0 23 36.45	1.8700	N. 5 8 54.0	14.806
	TUESDAY 10.					THURSDAY 12.			
0	22 57 46.95	1.8088	S. 6 19 42.2	14.172	0	0 25 28.74	1.8731	N. 5 23 42.1	14.797
1	22 59 35.47	1.8085	6 5 30.9	14.205	1	0 27 21.22	1.8763	5 38 29.6	14.787
2	23 1 23.97	1.8082	5 51 17.6	14.237	2	0 29 13.89	1.8795	5 53 16.6	14.777
3	23 3 12.46	1.8080	5 37 2.4	14.268	3	0 31 6.76	1.8828	6 8 2.9	14.765
4	23 5 0.93	1.8078	5 22 45.4	14.298	4	0 32 59.83	1.8862	6 22 48.4	14.752
5	23 6 49.40	1.8078	5 8 26.6	14.328	5	0 34 53.10	1.8895	6 37 33.1	14.737
6	23 8 37.87	1.8078	4 54 6.0	14.357	6	0 36 46.57	1.8930	6 52 16.9	14.722
7	23 10 26.34	1.8079	4 39 43.7	14.385	7	0 38 40.26	1.8967	7 6 59.7	14.706
8	23 12 14.82	1.8080	4 25 19.8	14.413	8	0 40 34.17	1.9003	7 21 41.6	14.689
9	23 14 3.30	1.8082	4 10 54.2	14.440	9	0 42 28.30	1.9041	7 36 22.4	14.670
10	23 15 51.80	1.8085	3 56 27.0	14.465	10	0 44 22.66	1.9079	7 51 2.0	14.650
11	23 17 40.32	1.8089	3 41 58.4	14.489	11	0 46 17.25	1.9118	8 5 40.4	14.629
12	23 19 28.87	1.8093	3 27 28.3	14.514	12	0 48 12.08	1.9158	8 20 17.5	14.607
13	23 21 17.44	1.8098	3 12 56.7	14.537	13	0 50 7.15	1.9198	8 34 53.2	14.584
14	23 23 6.05	1.8104	2 58 23.8	14.559	14	0 52 2.46	1.9239	8 49 27.6	14.561
15	23 24 54.69	1.8110	2 43 49.6	14.581	15	0 53 58.02	1.9281	9 4 0.5	14.535
16	23 26 43.37	1.8118	2 29 14.1	14.602	16	0 55 53.83	1.9323	9 18 31.8	14.508
17	23 28 32.10	1.8126	2 14 37.3	14.622	17	0 57 49.90	1.9367	9 33 1.4	14.480
18	24 30 20.88	1.8134	1 59 59.4	14.641	18	0 59 46.23	1.9411	9 47 29.4	14.452
19	23 32 9.71	1.8143	1 45 20.4	14.659	19	1 1 42.83	1.9456	10 1 55.6	14.421
20	23 33 58.60	1.8153	1 30 40.3	14.677	20	1 3 39.70	1.9501	10 16 19.9	14.389
21	23 35 47.55	1.8163	1 15 59.1	14.694	21	1 5 36.84	1.9547	10 30 42.3	14.357
22	23 37 36.56	1.8175	1 1 17.0	14.709	22	1 7 34.26	1.9594	10 45 2.7	14.323
23	23 39 25.65	1.8187	0 46 34.0	14.724	23	1 9 31.97	1.9642	10 59 21.0	14.288
24	23 41 14.81	1.8200	S. 0 31 50.1	14.738	24	1 11 29.96	1.9690	N. 11 13 37.2	14.252

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 13.					SUNDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 11 29.96	1.9690	N.11 13 37.2	14.252	0	2 52 45.12	2.2688	N.21 29 31.6	10.842
1	1 13 28.25	1.9739	11 27 51.2	14.214	1	2 55 1.47	2.2760	21 40 18.9	10.733
2	1 15 26.83	1.9788	11 42 2.9	14.174	2	2 57 18.24	2.2831	21 50 59.6	10.622
3	1 17 25.71	1.9838	11 56 12.1	14.133	3	2 59 35.44	2.2902	22 1 33.6	·10.510
4	1 19 24.89	1.9889	12 10 18.9	14.092	4	3 1 53.07	2.2974	22 12 0.8	10.397
5	1 21 24.38	1.9942	12 24 23.2	14.050	5	3 4 11.13	2.3046	22 22 21.2	10.282
6	1 23 24.19	1.9994	12 38 24.9	14.006	6	3 6 29.62	2.3117	22 32 34.7	10.166
7	1 25 24.31	2.0047	12 52 23.9	13.960	7	3 8 48.54	2.3189	22 42 41.1	10.047
8	1 27 24.75	2.0101	13 6 20.1	13.913	8	3 11 7.89	2.3261	22 52 40.3	9.927
9	1 29 25.52	2.0156	13 20 13.5	13.865	9	3 13 27.67	2.3332	23 2 32.3	9.805
10	1 31 26.62	2.0211	13 34 3.9	13.815	10	3 15 47.88	2.3403	23 12 16.9	9.682
11	1 33 28.05	2.0266	13 47 51.3	13.764	11	3 18 8.51	2.3474	23 21 54.1	9.557
12	1 35 29.81	2.0322	14 1 35.6	13.712	12	3 20 29.57	2.3545	23 31 23.7	9.430
13	1 37 31.91	2.0379	14 15 16.7	13.658	13	3 22 51.05	2.3616	23 40 45.7	9.302
14	1 39 34.36	2.0437	14 28 54.6	13.603	14	3 25 12.96	2.3687	23 50 0.0	9.172
15	1 41 37.16	2.0496	14 42 29.1	13.547	15	3 27 35.29	2.3757	23 59 6.4	9.041
16	1 43 40.31	2.0555	14 56 0.2	13.489	16	3 29 58.04	2.3826	24 8 4.9	8.908
17	1 45 43.82	2.0614	15 9 27.8	13.430	17	3 32 21.20	2.3896	24 16 55.4	8.775
18	1 47 47.68	2.0674	15 22 51.8	13.369	18	3 34 44.78	2.3965	24 25 37.9	8.639
19	1 49 51.91	2.0735	15 36 12.1	13.307	19	3 37 8.78	2.4033	24 34 12.1	8.501
20	1 51 56.50	2.0796	15 49 28.6	13.243	20	3 39 33.18	2.4101	24 42 38.0	8.362
21	1 54 1.46	2.0858	16 2 41.3	13.178	21	3 41 57.99	2.4169	24 50 55.6	8.222
22	1 56 6.79	2.0920	16 15 50.0	13.112	22	3 44 23.21	2.4237	24 59 4.7	8.080
23	1 58 12.50	2.0983	N.16 28 54.7	13.043	23	3 46 48.83	2.4303	N.25 7 5.2	7.936
	SATURDAY 14.					MONDAY 16.			
0	2 0 18.59	2.1047	N.16 41 55.2	12.973	0	3 49 14.85	2.4369	N.25 14 57.0	7.791
1	2 2 25.06	2.1110	16 54 51.5	12.902	1	3 51 41.26	2.4435	25 22 40.1	7.645
2	2 4 31.91	2.1174	17 7 43.5	12.831	2	3 54 8.07	2.4501	25 30 14.4	7.497
3	2 6 39.15	2.1239	17 20 31.2	12.758	3	3 56 35.27	2.4565	25 37 39.7	7.347
4	2 8 46.78	2.1305	17 33 14.4	12.682	4	3 59 2.85	2.4628	25 44 56.0	7.196
5	2 10 54.81	2.1371	17 45 53.0	12.603	5	4 1 30.81	2.4691	25 52 3.2	7.043
6	2 13 3.23	2.1437	17 58 26.8	12.524	6	4 3 59.14	2.4753	25 59 1.2	6.889
7	2 15 12.05	2.1503	18 10 55.9	12.445	7	4 6 27.84	2.4814	26 5 49.9	6.734
8	2 17 21.27	2.1570	18 23 20.2	12.363	8	4 8 56.91	2.4876	26 12 29.3	6.578
9	2 19 30.89	2.1638	18 35 39.5	12.280	9	4 11 26.35	2.4936	26 18 59.3	6.421
10	2 21 40.92	2.1706	18 47 53.8	12.196	10	4 13 56.14	2.4994	26 25 19.8	6.262
11	2 23 51.36	2.1774	19 0 3.0	12.109	11	4 16 26.28	2.5052	26 31 30.7	6.100
12	2 26 2.21	2.1843	19 12 6.9	12.021	12	4 18 56.76	2.5109	26 37 31.8	5.938
13	2 28 13.47	2.1912	19 24 5.5	11.932	13	4 21 27.58	2.5165	26 43 23.2	5.775
14	2 30 25.15	2.1982	19 35 58.7	11.841	14	4 23 58.74	2.5220	26 49 4.8	5.611
15	2 32 37.25	2.2051	19 47 46.4	11.748	15	4 26 30.22	2.5273	26 54 36.5	5.445
16	2 34 49.76	2.2120	19 59 28.5	11.654	16	4 29 2.02	2.5327	26 59 58.2	5.278
17	2 37 2.69	2.2191	20 11 4.9	11.557	17	4 31 34.14	2.5379	27 5 9.9	5.111
18	2 39 16.05	2.2262	20 22 35.4	11.459	18	4 34 6.57	2.5430	27 10 11.5	4.942
19	2 41 29.83	2.2332	20 34 0.0	11.361	19	4 36 39.30	2.5479	27 15 2.9	4.771
20	2 43 44.03	2.2403	20 45 18.7	11.261	20	4 39 12.32	2.5527	27 19 44.0	4.599
21	2 45 58.66	2.2474	20 56 31.3	11.158	21	4 41 45.62	2.5573	27 24 14.8	4.427
22	2 48 13.72	2.2546	21 7 37.7	11.054	22	4 44 19.20	2.5620	27 28 35.2	4.253
23	2 50 29.21	2.2617	21 18 37.8	10.949	23	4 46 53.06	2.5665	27 32 45.2	4.079
24	2 52 45.12	2.2688	N.21 29 31.6	10.842	24	4 49 27.18	2.5708	N.27 36 44.7	3.903

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 49 27.18	2.5708	N.27 36 44.7	3.903
1	4 52 1.56	2.5750	27 40 33.6	3.727
2	4 54 36.18	2.5790	27 44 11.9	3.549
3	4 57 11.04	2.5830	27 47 39.5	3.371
4	4 59 46.14	2.5868	27 50 56.4	3.192
5	5 2 21.46	2.5905	27 54 2.5	3.012
6	5 4 57.00	2.5941	27 56 57.8	2.831
7	5 7 32.75	2.5974	27 59 42.2	2.649
8	5 10 8.69	2.6006	28 2 15.7	2.467
9	5 12 44.82	2.6037	28 4 38.2	2.283
0	5 15 21.13	2.6066	28 6 49.7	2.100
1	5 17 57.61	2.6093	28 8 50.2	1.916
2	5 20 34.25	2.6119	28 10 39.6	1.731
3	5 23 11.04	2.6144	28 12 17.9	1.545
4	5 25 47.98	2.6167	28 13 45.0	1.359
5	5 28 25.05	2.6188	28 15 1.0	1.172
6	5 31 2.24	2.6208	28 16 5.7	0.985
7	5 33 39.55	2.6227	28 16 59.2	0.797
8	5 36 16.97	2.6244	28 17 41.4	0.610
9	5 38 54.48	2.6258	28 18 12.4	0.422
20	5 41 32.07	2.6272	28 18 32.0	0.233
21	5 44 9.74	2.6283	28 18 40.3	+0.044
22	5 46 47.47	2.6293	28 18 37.3	−0.145
23	5 49 25.26	2.6302	N.28 18 22.9	0.335

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 52 3.09	2.6308	N.28 17 57.1	0.524
1	5 54 40.96	2.6314	28 17 20.0	0.713
2	5 57 18.86	2.6317	28 16 31.5	0.903
3	5 59 56.77	2.6319	28 15 31.6	1.093
4	6 2 34.69	2.6320	28 14 20.3	1.282
5	6 5 12.61	2.6318	28 12 57.7	1.472
6	6 7 50.51	2.6315	28 11 23.7	1.662
7	6 10 28.39	2.6311	28 9 38.3	1.851
8	6 13 6.24	2.6305	28 7 41.6	2.040
9	6 15 44.05	2.6297	28 5 33.5	2.229
0	6 18 21.80	2.6288	28 3 14.1	2.418
1	6 20 59.50	2.6277	28 0 43.4	2.607
2	6 23 37.13	2.6265	27 58 1.3	2.796
3	6 26 14.68	2.6251	27 55 7.9	2.983
4	6 28 52.14	2.6236	27 52 3.3	3.170
5	6 31 29.50	2.6217	27 48 47.5	3.358
6	6 34 6.75	2.6199	27 45 20.4	3.545
7	6 36 43.89	2.6179	27 41 42.1	3.731
8	6 39 20.90	2.6158	27 37 52.7	3.917
9	6 41 57.78	2.6135	27 33 52.1	4.102
20	6 44 34.52	2.6110	27 29 40.4	4.287
21	6 47 11.10	2.6083	27 25 17.7	4.470
22	6 49 47.52	2.6057	27 20 44.0	4.653
23	6 52 23.78	2.6029	27 15 59.3	4.837
24	6 54 59.87	2.5999	N.27 11 3.6	5.019

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 54 59.87	2.5999	N.27 11 3.6	5.019
1	6 57 35.77	2.5967	27 5 57.0	5.200
2	7 0 11.48	2.5935	27 0 39.6	5.379
3	7 2 46.99	2.5902	26 55 11.5	5.558
4	7 5 22.30	2.5867	26 49 32.6	5.738
5	7 7 57.39	2.5830	26 43 42.9	5.917
6	7 10 32.26	2.5793	26 37 42.6	6.093
7	7 13 6.91	2.5755	26 31 31.8	6.268
8	7 15 41.32	2.5715	26 25 10.4	6.444
9	7 18 15.49	2.5674	26 18 38.5	6.618
10	7 20 49.41	2.5632	26 11 56.2	6.791
11	7 23 23.08	2.5590	26 5 3.6	6.962
12	7 25 56.49	2.5546	25 58 0.7	7.133
13	7 28 29.63	2.5502	25 50 47.6	7.303
14	7 31 2.51	2.5456	25 43 24.3	7.472
15	7 33 35.11	2.5409	25 35 51.0	7.639
16	7 36 7.42	2.5362	25 28 7.6	7.806
17	7 38 39.45	2.5314	25 20 14.3	7.971
18	7 41 11.19	2.5265	25 12 11.1	8.136
19	7 43 42.63	2.5215	25 3 58.1	8.298
20	7 46 13.77	2.5165	24 55 35.4	8.459
21	7 48 44.61	2.5114	24 47 3.0	8.619
22	7 51 15.14	2.5062	24 38 21.1	8.778
23	7 53 45.36	2.5010	N.24 29 29.7	8.935

FRIDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 56 15.26	2.4957	N.24 20 28.9	9.091
1	7 58 44.84	2.4903	24 11 18.8	9.246
2	8 1 14.10	2.4849	24 1 59.4	9.399
3	8 3 43.03	2.4795	23 52 30.9	9.551
4	8 6 11.64	2.4740	23 42 53.3	9.702
5	8 8 39.91	2.4684	23 33 6.7	9.851
6	8 11 7.85	2.4628	23 23 11.2	9.999
7	8 13 35.45	2.4573	23 13 6.8	10.146
8	8 16 2.72	2.4517	23 2 53.7	10.291
9	8 18 29.65	2.4459	22 52 31.9	10.434
10	8 20 56.23	2.4402	22 42 1.6	10.576
11	8 23 22.47	2.4345	22 31 22.8	10.717
12	8 25 48.37	2.4287	22 20 35.6	10.856
13	8 28 13.92	2.4229	22 9 40.1	10.993
14	8 30 39.12	2.4172	21 58 36.4	11.128
15	8 33 3.98	2.4114	21 47 24.7	11.262
16	8 35 28.49	2.4056	21 36 5.0	11.395
17	8 37 52.65	2.3998	21 24 37.3	11.527
18	8 40 16.46	2.3940	21 13 1.7	11.657
19	8 42 39.93	2.3882	21 1 18.4	11.785
20	8 45 3.04	2.3823	20 49 27.5	11.911
21	8 47 25.80	2.3764	20 37 29.1	12.036
22	8 49 48.21	2.3707	20 25 23.2	12.159
23	8 52 10.28	2.3649	20 13 10.0	12.281
24	8 54 32.00	2.3591	N.20 0 49.5	12.402

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 54 32.00	2.3591	N.20 0 49.5	12.402
1	8 56 53.37	2.3533	19 48 21.8	12.520
2	8 59 14.40	2.3476	19 35 47.1	12.637
3	9 1 35.09	2.3419	19 23 5.4	12.752
4	9 3 55.43	2.3362	19 10 16.8	12.866
5	9 6 15.43	2.3305	18 57 21.5	12.978
6	9 8 35.09	2.3248	18 44 19.5	13.088
7	9 10 54.41	2.3192	18 31 10.9	13.197
8	9 13 13.40	2.3137	18 17 55.8	13.304
9	9 15 32.05	2.3081	18 4 34.4	13.409
10	9 17 50.37	2.3026	17 51 6.7	13.513
11	9 20 8.36	2.2972	17 37 32.8	13.617
12	9 22 26.03	2.2917	17 23 52.7	13.718
13	9 24 43.37	2.2863	17 10 6.6	13.817
14	9 27 0.39	2.2809	16 56 14.7	13.913
15	9 29 17.08	2.2756	16 42 17.1	14.008
16	9 31 33.46	2.2703	16 28 13.8	14.102
17	9 33 49.52	2.2651	16 14 4.9	14.195
18	9 36 5.27	2.2599	15 59 50.4	14.287
19	9 38 20.71	2.2548	15 45 30.5	14.376
20	9 40 35.85	2.2497	15 31 5.3	14.463
21	9 42 50.68	2.2447	15 16 34.9	14.548
22	9 45 5.22	2.2398	15 1 59.5	14.633
23	9 47 19.46	2.2349	N.14 47 19.0	14.716

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 49 33.41	2.2301	N.14 32 33.6	14.797
1	9 51 47.07	2.2253	14 17 43.4	14.876
2	9 54 0.45	2.2207	14 2 48.5	14.953
3	9 56 13.55	2.2160	13 47 49.0	15.029
4	9 58 26.37	2.2114	13 32 45.0	15.103
5	10 0 38.92	2.2068	13 17 36.6	15.177
6	10 2 51.19	2.2023	13 2 23.8	15.248
7	10 5 3.20	2.1980	12 47 6.8	15.317
8	10 7 14.95	2.1937	12 31 45.7	15.385
9	10 9 26.45	2.1895	12 16 20.6	15.451
10	10 11 37.69	2.1853	12 0 51.6	15.516
11	10 13 48.69	2.1812	11 45 18.7	15.579
12	10 15 59.44	2.1772	11 29 42.1	15.640
13	10 18 9.95	2.1732	11 14 1.9	15.700
14	10 20 20.23	2.1693	10 58 18.1	15.759
15	10 22 30.27	2.1655	10 42 30.8	15.816
16	10 24 40.09	2.1618	10 26 40.2	15.870
17	10 26 49.69	2.1582	10 10 46.4	15.923
18	10 28 59.07	2.1546	9 54 49.4	15.975
19	10 31 8.24	2.1511	9 38 49.4	16.025
20	10 33 17.20	2.1477	9 22 46.4	16.074
21	10 35 25.96	2.1443	9 6 40.5	16.122
22	10 37 34.52	2.1411	8 50 31.8	16.167
23	10 39 42.89	2.1378	8 34 20.5	16.210
24	10 41 51.06	2.1347	N. 8 18 6.6	16.252

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 41 51.06	2.1347	N. 8 18 6.6	16.252
1	10 43 59.05	2.1317	8 1 50.2	16.293
2	10 46 6.87	2.1288	7 45 31.4	16.332
3	10 48 14.51	2.1259	7 29 10.3	16.370
4	10 50 21.98	2.1232	7 12 47.0	16.406
5	10 52 29.29	2.1204	6 56 21.6	16.440
6	10 54 36.43	2.1177	6 39 54.2	16.472
7	10 56 43.42	2.1152	6 23 24.9	16.503
8	10 58 50.26	2.1128	6 6 53.8	16.533
9	11 0 56.96	2.1105	5 50 20.9	16.562
10	11 3 3.52	2.1082	5 33 46.4	16.588
11	11 5 9.95	2.1060	5 17 10.3	16.613
12	11 7 16.24	2.1038	5 0 32.8	16.637
13	11 9 22.41	2.1018	4 43 53.9	16.658
14	11 11 28.46	2.0998	4 27 13.8	16.678
15	11 13 34.39	2.0979	4 10 32.5	16.697
16	11 15 40.21	2.0962	3 53 50.1	16.715
17	11 17 45.93	2.0945	3 37 6.7	16.730
18	11 19 51.55	2.0929	3 20 22.5	16.743
19	11 21 57.08	2.0913	3 3 37.5	16.756
20	11 24 2.51	2.0898	2 46 51.8	16.767
21	11 26 7.86	2.0885	2 30 5.4	16.777
22	11 28 13.13	2.0873	2 13 18.5	16.785
23	11 30 18.33	2.0861	N. 1 56 31.2	16.791

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 32 23.46	2.0850	N. 1 39 43.6	16.796
1	11 34 28.53	2.0839	1 22 55.7	16.799
2	11 36 33.53	2.0829	1 6 7.7	16.801
3	11 38 38.48	2.0821	0 49 19.6	16.801
4	11 40 43.38	2.0813	0 32 31.6	16.799
5	11 42 48.23	2.0806	N. 0 15 43.7	16.797
6	11 44 53.05	2.0801	S. 0 1 4.0	16.793
7	11 46 57.84	2.0795	0 17 51.4	16.787
8	11 49 2.59	2.0790	0 34 38.4	16.779
9	11 51 7.32	2.0787	0 51 24.9	16.770
10	11 53 12.03	2.0784	1 8 10.8	16.760
11	11 55 16.72	2.0782	1 24 56.1	16.748
12	11 57 21.41	2.0781	1 41 40.6	16.734
13	11 59 26.09	2.0780	1 58 24.2	16.719
14	12 1 30.77	2.0781	2 15 6.9	16.703
15	12 3 35.46	2.0782	2 31 48.6	16.686
16	12 5 40.15	2.0783	2 48 29.2	16.666
17	12 7 44.86	2.0786	3 5 8.5	16.644
18	12 9 49.59	2.0790	3 21 46.5	16.622
19	12 11 54.34	2.0794	3 38 23.1	16.598
20	12 13 59.12	2.0799	3 54 58.2	16.573
21	12 16 3.93	2.0805	4 11 31.8	16.546
22	12 18 8.78	2.0812	4 28 3.7	16.517
23	12 20 13.67	2.0819	4 44 33.9	16.487
24	12 22 18.61	2.0827	S. 5 1 2.2	16.456

APRIL, 1877.

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 22 18.61	2.0827	S. 5 1 2.2	16.456
1	12 24 23.60	2.0836	5 17 28.6	16.423
2	12 26 28.64	2.0846	5 33 53.0	16.388
3	12 28 33.75	2.0857	5 50 15.2	16.352
4	12 30 38.92	2.0868	6 6 35.2	16.315
5	12 32 44.16	2.0879	6 22 53.0	16.277
6	12 34 49.47	2.0892	6 39 8.4	16.236
7	12 36 54.86	2.0905	6 55 21.3	16.194
8	12 39 0.33	2.0919	7 11 31.7	16.151
9	12 41 5.89	2.0934	7 27 39.4	16.106
10	12 43 11.54	2.0949	7 43 44.4	16.060
11	12 45 17.28	2.0965	7 59 46.6	16.012
12	12 47 23.12	2.0982	8 15 45.8	15.962
13	12 49 29.06	2.0999	8 31 42.0	15.912
14	12 51 35.11	2.1018	8 47 35.2	15.860
15	12 53 41.27	2.1037	9 3 25.2	15.806
16	12 55 47.55	2.1056	9 19 11.9	15.751
17	12 57 53.94	2.1075	9 34 55.3	15.695
18	13 0 0.45	2.1096	9 50 35.3	15.637
19	13 2 7.09	2.1117	10 6 11.7	15.577
20	13 4 13.86	2.1138	10 21 44.5	15.517
21	13 6 20.75	2.1160	10 37 13.7	15.455
22	13 8 27.78	2.1184	10 52 39.1	15.391
23	13 10 34.96	2.1208	S. 11 8 0.6	15.325

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 12 42.28	2.1232	S. 11 23 18.1	15.258
1	13 14 49.74	2.1257	11 38 31.6	15.191
2	13 16 57.36	2.1282	11 53 41.0	15.122
3	13 19 5.13	2.1308	12 8 46.2	15.051
4	13 21 13.06	2.1334	12 23 47.1	14.978
5	13 23 21.14	2.1360	12 38 43.6	14.905
6	13 25 29.38	2.1388	12 53 35.7	14.830
7	13 27 37.79	2.1416	13 8 23.2	14.753
8	13 29 46.37	2.1444	13 23 6.1	14.676
9	13 31 55.12	2.1473	13 37 44.3	14.597
10	13 34 4.04	2.1502	13 52 17.7	14.516
11	13 36 13.14	2.1531	14 6 46.2	14.433
12	13 38 22.41	2.1561	14 21 9.7	14.349
13	13 40 31.87	2.1592	14 35 28.1	14.265
14	13 42 41.51	2.1622	14 49 41.5	14.180
15	13 44 51.33	2.1653	15 3 49.7	14.092
16	13 47 1.34	2.1685	15 17 52.6	14.003
17	13 49 11.55	2.1717	15 31 50.1	13.913
18	13 51 21.95	2.1749	15 45 42.2	13.822
19	13 53 32.54	2.1782	15 59 28.7	13.729
20	13 55 43.33	2.1814	16 13 9.6	13.635
21	13 57 54.31	2.1847	16 26 44.9	13.540
22	14 0 5.49	2.1881	16 40 14.4	13.442
23	14 2 16.88	2.1915	16 53 38.0	13.344
24	14 4 28.47	2.1948	S. 17 6 55.7	13.245

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 4 28.47	2.1948	S. 17 6 55.7	13.245
1	14 6 40.26	2.1982	17 20 7.4	13.144
2	14 8 52.26	2.2017	17 33 13.0	13.042
3	14 11 4.46	2.2051	17 46 12.5	12.939
4	14 13 16.87	2.2086	17 59 5.7	12.834
5	14 15 29.49	2.2120	18 11 52.6	12.729
6	14 17 42.31	2.2154	18 24 33.2	12.622
7	14 19 55.34	2.2190	18 37 7.3	12.513
8	14 22 8.59	2.2226	18 49 34.8	12.404
9	14 24 22.05	2.2261	19 1 55.8	12.294
10	14 26 35.72	2.2296	19 14 10.1	12.182
11	14 28 49.60	2.2331	19 26 17.6	12.068
12	14 31 3.69	2.2366	19 38 18.3	11.954
13	14 33 17.99	2.2401	19 50 12.1	11.839
14	14 35 32.50	2.2437	20 1 59.0	11.722
15	14 37 47.23	2.2472	20 13 38.8	11.604
16	14 40 2.17	2.2507	20 25 11.5	11.486
17	14 42 17.32	2.2542	20 36 37.1	11.366
18	14 44 32.68	2.2577	20 47 55.4	11.244
19	14 46 48.25	2.2612	20 59 6.4	11.122
20	14 49 4.03	2.2647	21 10 10.1	10.999
21	14 51 20.02	2.2682	21 21 6.3	10.874
22	14 53 36.21	2.2716	21 31 55.0	10.749
23	14 55 52.61	2.2751	S. 21 42 36.2	10.623

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 58 9.22	2.2785	S. 21 53 9.8	10.496
1	15 0 26.03	2.2818	22 3 35.7	10.367
2	15 2 43.04	2.2852	22 13 53.8	10.237
3	15 5 0.25	2.2885	22 24 4.1	10.106
4	15 7 17.66	2.2918	22 34 6.5	9.975
5	15 9 35.27	2.2951	22 44 1.1	9.843
6	15 11 53.07	2.2983	22 53 47.7	9.709
7	15 14 11.07	2.3015	23 3 26.2	9.574
8	15 16 29.25	2.3046	23 12 56.6	9.439
9	15 18 47.62	2.3077	23 22 18.9	9.303
10	15 21 6.17	2.3108	23 31 33.0	9.167
11	15 23 24.91	2.3138	23 40 38.9	9.028
12	15 25 43.83	2.3167	23 49 36.4	8.888
13	15 28 2.92	2.3197	23 58 25.5	8.749
14	15 30 22.19	2.3226	24 7 6.3	8.610
15	15 32 41.63	2.3254	24 15 38.7	8.469
16	15 35 1.24	2.3282	24 24 2.6	8.327
17	15 37 21.01	2.3309	24 32 17.9	8.183
18	15 39 40.95	2.3336	24 40 24.6	8.040
19	15 42 1.05	2.3362	24 48 22.7	7.896
20	15 44 21.29	2.3386	24 56 12.1	7.751
21	15 46 41.68	2.3411	25 3 52.8	7.606
22	15 49 2.22	2.3435	25 11 24.8	7.460
23	15 51 22.90	2.3459	25 18 48.0	7.313
24	15 53 43.73	2.3482	S. 25 26 2.3	7.165

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 53 43.73	2.3482	S.25 26 2.3	7.165
1	15 56 4.69	2.3503	25 33 7.8	7.017
2	15 58 25.77	2.3524	25 40 4.4	6.868
3	16 0 46.98	2.3545	25 46 52.0	6.719
4	16 3 8.31	2.3564	25 53 30.7	6.570
5	16 5 29.75	2.3583	26 0 0.4	6.419
6	16 7 51.30	2.3601	26 6 21.0	6.268
7	16 10 12.96	2.3618	26 12 32.6	6.117
8	16 12 34.72	2.3635	26 18 35.1	5.966
9	16 14 56.58	2.3651	26 24 28.5	5.814
10	16 17 18.53	2.3665	26 30 12.8	5.662
11	16 19 40.56	2.3678	26 35 47.9	5.508
12	16 22 2.67	2.3691	26 41 13.8	5.355
13	16 24 24.86	2.3703	26 46 30.5	5.202
14	16 26 47.11	2.3714	26 51 38.0	5.048
15	16 29 9.43	2.3725	26 56 36.3	4.894
16	16 31 31.81	2.3734	27 1 25.3	4.740
17	16 33 54.24	2.3742	27 6 5.1	4.586
18	16 36 16.72	2.3750	27 10 35.6	4.431
19	16 38 39.24	2.3757	27 14 56.8	4.276
20	16 41 1.80	2.3762	27 19 8.7	4.121
21	16 43 24.38	2.3766	27 23 11.3	3.965
22	16 45 46.99	2.3770	27 27 4.5	3.809
23	16 48 9.62	2.3772	27 30 48.4	3.654
24	16 50 32.25	2.3773	S.27 34 23.0	3.498

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 50 32.25	2.3773	S.27 34 23.0	3.498
1	16 52 54.89	2.3773	27 37 48.2	3.343
2	16 55 17.53	2.3773	27 41 4.1	3.188
3	16 57 40.17	2.3772	27 44 10.7	3.032
4	17 0 2.79	2.3769	27 47 7.9	2.875
5	17 2 25.40	2.3766	27 49 55.7	2.719
6	17 4 47.98	2.3761	27 52 34.2	2.564
7	17 7 10.53	2.3755	27 55 3.4	2.408
8	17 9 33.04	2.3748	27 57 23.2	2.252
9	17 11 55.51	2.3741	27 59 33.7	2.097
10	17 14 17.93	2.3732	28 1 34.9	1.942
11	17 16 40.30	2.3722	28 3 26.8	1.787
12	17 19 2.60	2.3712	28 5 9.4	1.632
13	17 21 24.84	2.3700	28 6 42.7	1.477
14	17 23 47.00	2.3687	28 8 6.7	1.323
15	17 26 9.08	2.3673	28 9 21.5	1.169
16	17 28 31.07	2.3658	28 10 27.0	1.015
17	17 30 52.97	2.3642	28 11 23.3	0.862
18	17 33 14.77	2.3625	28 12 10.4	0.708
19	17 35 36.47	2.3607	28 12 48.3	0.555
20	17 37 58.05	2.3588	28 13 17.0	0.403
21	17 40 19.52	2.3568	28 13 36.6	0.251
22	17 42 40.87	2.3547	28 13 47.1	−0.099
23	17 45 2.09	2.3525	28 13 48.5	+0.059
24	17 47 23.17	2.3502	S.28 13 40.8	0.203

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, ...	5	4	29.8
● New Moon, ...	13	5	49.9
☽ First Quarter, ...	20	7	37.0
○ Full Moon, ...	27	4	36.0

	d	h
☾ Apogee, ...	7	0.0
☾ Perigee, ...	22	4.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	85° 35′ 10″	2616	87° 13′ 43″	2632	88° 51′ 54″	2649	90° 29′ 43″	2666
	Spica	W.	31 35 42	2621	33 14 9	2637	34 52 14	2653	36 29 57	2669
	Jupiter	E.	39 44 47	2680	38 7 40	2700	36 31 0	2720	34 54 47	2741
	Mars	E.	56 24 59	2842	54 51 26	2859	53 18 15	2877	51 45 27	2894
	α Aquilæ	E.	72 13 4	3461	70 51 56	3494	69 31 25	3529	68 11 33	3566
	Sun	E.	137 58 17	2963	136 27 18	2980	134 56 40	2997	133 26 24	3015
2	Regulus	W.	98 33 18	2746	100 8 57	2761	101 44 16	2776	103 19 15	2792
	Spica	W.	44 33 12	2748	46 8 48	2763	47 44 4	2779	49 19 0	2794
	Jupiter	E.	27 0 52	2856	25 27 37	2883	23 54 57	2912	22 22 54	2944
	Mars	E.	44 7 0	2981	42 36 24	2998	41 6 9	3015	39 36 15	3032
	α Aquilæ	E.	61 42 52	3778	60 27 27	3826	59 12 52	3878	57 59 10	3931
	Saturn	E.	97 39 37	2787	96 4 52	2802	94 30 27	2818	92 56 22	2833
	α Pegasi	E.	105 56 40	2988	104 26 12	3000	102 52 59	3012	101 26 1	3025
	Sun	E.	126 0 26	3101	124 32 17	3117	123 4 28	3133	121 36 59	3150
3	Spica	W.	57 8 54	2864	58 41 59	2877	60 14 47	2890	61 47 18	2902
	Mars	E.	32 11 51	3113	30 43 57	3129	29 16 23	3144	27 49 7	3160
	α Aquilæ	E.	52 5 7	4252	50 57 30	4330	49 51 5	4411	48 45 54	4500
	Fomalhaut	E.	72 7 10	3174	70 40 30	3194	69 14 14	3214	67 48 21	3234
	Saturn	E.	85 10 44	2904	83 38 30	2918	82 6 34	2931	80 34 54	2944
	α Pegasi	E.	94 0 5	3087	92 31 40	3101	91 3 31	3113	89 35 37	3126
	Sun	E.	114 24 19	3226	112 58 41	3241	111 33 20	3254	110 8 15	3268
4	Spica	W.	69 26 7	2959	70 57 11	2969	72 28 2	2979	73 58 41	2989
	Antares	W.	23 31 59	2960	25 3 2	2969	26 33 53	2979	28 4 32	2988
	Fomalhaut	E.	60 44 55	3338	59 21 27	3360	57 58 25	3383	56 35 49	3407
	Saturn	E.	73 0 26	3001	71 30 15	3011	70 0 16	3022	68 30 30	3030
	α Pegasi	E.	82 19 56	3188	80 53 32	3200	79 27 23	3212	78 1 28	3224
	Sun	E.	103 6 40	3330	101 43 3	3341	100 19 39	3351	98 56 27	3362
5	Spica	W.	81 29 12	3028	82 58 50	3034	84 28 20	3041	85 57 42	3046
	Antares	W.	35 35 7	3027	37 4 46	3034	38 34 16	3040	40 3 39	3045
	Fomalhaut	E.	49 49 52	3540	48 30 12	3571	47 11 6	3604	45 52 36	3638
	Saturn	E.	61 4 21	3071	59 35 36	3078	58 6 59	3084	56 38 30	3090
	α Pegasi	E.	70 55 21	3282	69 30 48	3294	68 6 29	3305	66 42 23	3317
	Sun	E.	92 3 9	3405	90 40 58	3412	89 18 55	3418	87 56 59	3425
6	Antares	W.	47 29 7	3065	48 57 59	3069	50 26 47	3070	51 55 33	3072
	Jupiter	W.	22 40 36	3196	24 6 50	3186	25 33 16	3178	26 59 52	3170
	Fomalhaut	E.	39 30 20	3858	38 16 18	3915	37 3 13	3977	35 51 11	4046
	Saturn	E.	49 17 37	3111	47 49 41	3114	46 21 48	3116	44 53 58	3119
	α Pegasi	E.	59 45 18	3377	58 22 35	3389	57 0 6	3402	55 37 52	3415
	Sun	E.	81 8 54	3447	79 47 31	3450	78 26 11	3453	77 4 54	3455
7	Antares	W.	59 19 4	3073	60 47 46	3072	62 16 30	3070	63 45 16	3069
	Jupiter	W.	34 14 50	3142	35 42 9	3137	37 9 34	3132	38 37 5	3126
	Mars	W.	13 46 0	3405	15 8 11	3390	16 30 39	3376	17 53 23	3365
	Saturn	E.	37 35 16	3122	36 7 33	3121	34 39 49	3121	33 12 5	3119
	α Pegasi	E.	48 50 49	3496	47 30 20	3515	46 10 13	3536	44 50 29	3559
	Sun	E.	70 18 52	3457	68 57 40	3455	67 36 26	3454	66 15 11	3453
8	Antares	W.	71 9 52	3052	72 39 1	3047	74 8 15	3043	75 37 35	3037

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	92° 7′ 9″	2682	93° 44′ 13″	2698	95° 20′ 56″	2713	96° 57′ 18″	2730
	Spica	W.	38 7 19	2685	39 44 19	2701	41 20 58	2717	42 57 15	2732
	Jupiter	E.	33 19 2	2763	31 43 45	2785	30 8 57	2808	28 34 39	2831
	Mars	E.	50 13 1	2912	48 40 58	2930	47 9 17	2947	45 37 58	2964
	α Aquilæ	E.	66 52 22	3605	65 33 53	3645	64 16 7	3687	62 59 6	3731
	Sun	E.	131 56 30	3032	130 26 57	3050	128 57 46	3067	127 28 56	3083
2	Regulus	W.	104 53 54	2806	106 28 14	2821	108 2 15	2835	109 35 58	2849
	Spica	W.	50 53 36	2808	52 27 53	2822	54 1 52	2837	55 35 32	2851
	Jupiter	E.	20 51 31	2979	19 20 52	3019	17 51 3	3066	16 22 12	3126
	Mars	E.	38 6 42	3048	36 37 29	3065	35 8 37	3081	33 40 4	3097
	α Aquilæ	E.	56 46 22	3988	55 34 31	4049	54 23 40	4113	53 13 51	4181
	Saturn	E.	91 22 37	2848	89 49 11	2862	88 16 4	2876	86 43 15	2891
	α Pegasi	E.	99 56 19	3037	98 26 52	3050	96 57 41	3062	95 28 45	3075
	Sun	E.	120 9 50	3166	118 43 0	3181	117 16 28	3197	115 50 15	3211
3	Spica	W.	63 19 34	2915	64 51 34	2927	66 23 19	2938	67 54 50	2949
	Mars	E.	26 22 10	3176	24 55 32	3192	23 29 13	3209	22 3 14	3225
	α Aquilæ	E.	47 42 2	4593	46 39 31	4695	45 38 27	4804	44 38 54	4921
	Fomalhaut	E.	66 22 52	3253	64 57 46	3275	63 33 5	3295	62 8 48	3316
	Saturn	E.	79 3 31	2956	77 32 23	2968	76 1 30	2979	74 30 51	2990
	α Pegasi	E.	88 7 59	3138	86 40 36	3151	85 13 28	3163	83 46 35	3175
	Sun	E.	108 43 26	3282	107 18 53	3294	105 54 34	3306	104 30 30	3319
4	Spica	W.	75 29 8	2997	76 59 24	3005	78 29 30	3014	79 59 26	3022
	Antares	W.	29 35 0	2997	31 5 17	3005	32 35 23	3013	34 5 20	3021
	Fomalhaut	E.	55 13 40	3431	53 51 59	3457	52 30 47	3483	51 10 4	3511
	Saturn	E.	67 0 55	3039	65 31 31	3048	64 2 18	3056	62 33 15	3064
	α Pegasi	E.	76 35 47	3236	75 10 20	3247	73 45 7	3259	72 20 7	3270
	Sun	E.	97 33 27	3371	96 10 37	3380	94 47 58	3389	93 25 29	3397
5	Spica	W.	87 26 58	3052	88 56 7	3056	90 25 11	3060	91 54 10	3063
	Antares	W.	41 32 56	3051	43 2 6	3055	44 31 11	3059	46 0 11	3062
	Fomalhaut	E.	44 34 43	3676	43 17 30	3716	42 1 0	3759	40 45 15	3807
	Saturn	E.	55 10 8	3095	53 41 52	3100	52 13 42	3104	50 45 37	3108
	α Pegasi	E.	65 18 31	3328	63 54 52	3339	62 31 26	3352	61 8 15	3365
	Sun	E.	86 35 11	3431	85 13 29	3435	83 51 52	3440	82 30 21	3444
6	Antares	W.	53 24 17	3073	54 52 59	3073	56 21 41	3074	57 50 22	3073
	Jupiter	W.	28 26 37	3163	29 53 30	3158	31 20 30	3152	32 47 37	3147
	Fomalhaut	E.	34 40 17	4125	33 30 39	4211	32 22 23	4309	31 15 39	4420
	Saturn	E.	43 26 11	3120	41 58 26	3121	40 30 42	3122	39 2 59	3122
	α Pegasi	E.	54 15 53	3430	52 54 10	3446	51 32 45	3462	50 11 38	3478
	Sun	E.	75 43 40	3456	74 22 27	3457	73 1 15	3458	71 40 4	3457
7	Antares	W.	65 14 4	3066	66 42 55	3063	68 11 50	3060	69 40 49	3056
	Jupiter	W.	40 4 43	3121	41 32 27	3116	43 0 17	3110	44 28 14	3104
	Mars	W.	19 16 20	3354	20 39 29	3345	22 2 49	3336	23 26 19	3328
	Saturn	E.	31 44 19	3118	30 16 31	3116	28 48 41	3114	27 20 49	3111
	α Pegasi	E.	43 31 10	3584	42 12 18	3612	40 53 57	3643	39 36 9	3677
	Sun	E.	64 53 54	3450	63 32 34	3447	62 11 11	3444	60 49 44	3440
8	Antares	W.	77 7 2	3031	78 36 36	3026	80 6 17	3019	81 36 6	3012

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Jupiter	W.	45° 56′ 19″	3098	47° 24′ 31″	3092	48° 52′ 50″	3086	50° 21′ 17″	3078
	Mars	W.	24 49 58	3320	26 13 46	3313	27 37 43	3305	29 1 49	3297
	Sun	E.	59 28 13	3436	58 6 37	3431	56 44 56	3427	55 23 10	3421
9	Antares	W.	83 6 4	3005	84 36 10	2998	86 6 25	2990	87 36 50	2983
	Jupiter	W.	57 45 44	3042	59 15 5	3033	60 44 37	3025	62 14 19	3016
	α Aquilæ	W.	42 19 33	5152	43 14 31	5025	44 11 7	4906	45 9 17	4798
	Mars	W.	36 4 39	3256	37 29 42	3247	38 54 56	3238	40 20 20	3229
	Sun	E.	48 32 39	3390	47 10 11	3382	45 47 34	3374	44 24 48	3367
10	Jupiter	W.	69 45 38	2969	71 16 29	2960	72 47 32	2950	74 18 48	2939
	α Aquilæ	W.	50 20 42	4363	51 26 37	4293	52 33 36	4229	53 41 35	4167
	Mars	W.	47 30 9	3180	48 56 42	3169	50 23 28	3158	51 50 27	3148
	Sun	E.	37 28 44	3326	36 5 2	3318	34 41 11	3309	33 17 10	3300
11	Jupiter	W.	81 58 26	2887	83 31 2	2876	85 3 52	2865	86 36 56	2854
	Mars	W.	59 8 37	3092	60 36 56	3081	62 5 29	3069	63 34 16	3058
	Sun	E.	26 14 40	3261	24 49 43	3255	23 24 39	3250	21 59 29	3247
15	Sun	W.	21 58 36	2917	23 30 33	2901	25 2 50	2887	26 35 25	2873
	Pollux	E.	64 5 37	2538	62 25 16	2529	60 44 43	2521	59 3 59	2513
	Regulus	E.	100 57 9	2530	99 16 38	2522	97 35 56	2514	95 55 2	2506
16	Sun	W.	34 22 21	2818	35 56 26	2808	37 30 44	2798	39 5 14	2790
	Pollux	E.	50 37 38	2477	48 55 52	2470	47 13 56	2463	45 31 51	2457
	Regulus	E.	87 27 47	2467	85 45 47	2460	84 3 38	2453	82 21 19	2446
17	Sun	W.	47 0 28	2750	48 36 2	2743	50 11 45	2736	51 47 37	2729
	Pollux	E.	36 59 20	2429	35 16 27	2424	33 33 27	2421	31 50 22	2417
	Regulus	E.	73 47 21	2414	72 4 6	2408	70 20 43	2402	68 37 11	2396
18	Sun	W.	59 49 9	2698	61 25 52	2692	63 2 42	2687	64 39 40	2681
	Aldebaran	W.	22 38 21	2896	24 10 46	2822	25 44 45	2763	27 20 1	2713
	Regulus	E.	59 57 32	2370	58 13 14	2364	56 28 48	2359	54 44 15	2355
19	Sun	W.	72 46 14	2657	74 23 52	2652	76 1 37	2647	77 39 28	2643
	Aldebaran	W.	35 30 4	2553	37 10 4	2532	38 50 33	2513	40 31 28	2495
	Regulus	E.	45 59 51	2333	44 14 40	2328	42 29 22	2324	40 43 58	2321
	Spica	E.	100 1 5	2333	98 15 53	2328	96 30 35	2325	94 45 12	2322
20	Sun	W.	85 50 4	2624	87 28 27	2621	89 6 54	2617	90 45 26	2613
	Aldebaran	W.	49 1 22	2432	50 44 11	2422	52 27 14	2413	54 10 30	2405
	Regulus	E.	31 55 38	2303	30 9 43	2300	28 23 43	2297	26 37 39	2294
	Spica	E.	85 56 59	2304	84 11 5	2300	82 25 6	2297	80 39 2	2294
21	Sun	W.	98 59 8	2600	100 38 3	2598	102 17 1	2596	103 56 1	2594
	Aldebaran	W.	62 49 25	2373	64 33 38	2368	66 17 59	2364	68 2 26	2359
	Pollux	W.	19 20 13	2324	21 5 37	2317	22 51 12	2309	24 36 58	2303
	Spica	E.	71 47 42	2281	70 1 15	2279	68 14 44	2277	66 28 11	2275
22	Sun	W.	112 11 36	2588	113 50 47	2588	115 29 59	2588	117 9 11	2587
	Aldebaran	W.	76 45 59	2345	78 30 53	2343	80 15 50	2342	82 0 49	2341
	Pollux	W.	33 27 39	2284	35 14 2	2281	37 0 29	2279	38 46 59	2278

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8	Jupiter	W.	51° 49′ 53″	3079	53° 18′ 37″	3065	54° 47′ 30″	3057	56° 16′ 32″	3049
	Mars	W.	30 26 4	3289	31 50 28	3281	33 15 2	3272	34 39 46	3265
	Sun	E.	54 1 17	3415	52 39 18	3409	51 17 12	3403	49 54 59	3397
9	Antares	W.	89 7 24	2974	90 38 9	2966	92 9 4	2958	93 40 10	2948
	Jupiter	W.	63 44 12	3007	65 14 16	2997	66 44 32	2989	68 14 59	2979
	α Aquilæ	W.	46 8 55	4697	47 9 57	4604	48 12 18	4518	49 15 54	4437
	Mars	W.	41 45 55	3220	43 11 41	3209	44 37 39	3200	46 3 48	3190
	Sun	E.	43 1 54	3359	41 38 51	3351	40 15 38	3343	38 52 16	3334
10	Jupiter	W.	75 50 17	2929	77 21 59	2918	78 53 55	2908	80 26 4	2898
	α Aquilæ	W.	54 50 32	4110	56 0 24	4056	57 11 8	4006	58 22 42	3958
	Mars	W.	53 17 38	3138	54 45 2	3126	56 12 40	3114	57 40 32	3104
	Sun	E.	31 52 59	3292	30 28 38	3284	29 4 8	3276	27 39 28	3269
11	Jupiter	W.	88 10 14	2849	89 43 47	2831	91 17 34	2821	92 51 35	2809
	Mars	W.	65 3 17	3047	66 32 32	3034	68 2 2	3023	69 31 46	3012
	Sun	E.	20 34 15	3944	19 8 58	3944	17 43 41	3947	16 18 27	3953
15	Sun	W.	28 8 18	2861	29 41 27	2849	31 14 51	2838	32 48 29	2828
	Pollux	E.	57 23 4	2505	55 41 58	2498	54 0 42	2490	52 19 15	2483
	Regulus	E.	94 13 57	2498	92 32 41	2490	90 51 14	2482	89 9 36	2475
16	Sun	W.	40 39 55	2781	42 14 48	2773	43 49 51	2766	45 25 4	2757
	Pollux	E.	43 49 37	2451	42 7 15	2445	40 24 44	2440	38 42 6	2434
	Regulus	E.	80 38 50	2440	78 56 12	2433	77 13 24	2426	75 30 27	2420
17	Sun	W.	53 23 39	2722	54 59 49	2716	56 36 8	2710	58 12 35	2704
	Pollux	E.	30 7 11	2413	28 23 55	2410	26 40 35	2409	24 57 13	2408
	Regulus	E.	66 53 31	2391	65 9 43	2385	63 25 47	2380	61 41 43	2375
18	Sun	W.	66 16 45	2676	67 53 57	2671	69 31 16	2666	71 8 42	2661
	Aldebaran	W.	28 56 23	2672	30 33 41	2635	32 11 48	2604	33 50 37	2577
	Regulus	E.	52 59 35	2350	51 14 49	2346	49 29 56	2342	47 44 57	2337
19	Sun	W.	79 17 24	2639	80 55 26	2635	82 33 33	2631	84 11 46	2627
	Aldebaran	W.	42 12 48	2480	43 54 29	2467	45 36 29	2454	47 18 47	2442
	Regulus	E.	38 58 29	2317	37 12 54	2313	35 27 14	2310	33 41 29	2306
	Spica	E.	92 59 44	2318	91 14 11	2314	89 28 32	2311	87 42 48	2307
20	Sun	W.	92 24 3	2610	94 2 44	2608	95 41 28	2605	97 20 16	2602
	Aldebaran	W.	55 53 57	2396	57 37 35	2391	59 21 23	2364	61 5 20	2379
	Regulus	E.	24 51 30	2291	23 5 17	2289	21 19 1	2286	19 32 41	2284
	Spica	E.	78 52 54	2291	77 6 42	2289	75 20 26	2286	73 34 6	2283
21	Sun	W.	105 35 4	2593	107 14 9	2591	108 53 17	2590	110 32 26	2589
	Aldebaran	W.	69 46 59	2355	71 31 38	2353	73 16 21	2350	75 1 8	2347
	Pollux	W.	26 22 53	2298	28 8 56	2294	29 55 5	2289	31 41 20	2287
	Spica	E.	64 41 35	2274	62 54 57	2272	61 8 16	2270	59 21 33	2270
22	Sun	W.	118 48 24	2588	120 27 36	2588	122 6 47	2590	123 45 56	2591
	Aldebaran	W.	83 45 49	2340	85 30 50	2339	87 15 52	2340	89 0 53	2340
	Pollux	W.	40 33 31	2277	42 20 4	2276	44 6 39	2276	45 53 14	2276

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22	Spica	E.	57° 34′ 49″	2268	55° 48′ 3″	2268	54° 1′ 16″	2267	52° 14′ 28″	2267
	Antares	E.	103 28 16	2266	101 41 27	2266	99 54 37	2266	98 7 47	2265
23	Sun	W.	125 25 4	2593	127 4 9	2594	128 43 12	2596	130 22 12	2599
	Aldebaran	W.	90 45 54	2341	92 30 54	2342	94 15 52	2344	96 0 48	2346
	Pollux	W.	47 39 49	2276	49 26 24	2277	51 12 58	2277	52 59 31	2279
	Spica	E.	43 20 30	2269	41 33 45	2270	39 47 2	2272	38 0 22	2274
	Antares	E.	89 13 33	2266	87 26 44	2268	85 39 57	2269	83 53 12	2270
	Jupiter	E.	114 46 0	2283	112 59 35	2283	111 13 11	2284	109 26 48	2285
24	Pollux	W.	61 51 40	2289	63 37 55	2293	65 24 5	2296	67 10 10	2300
	Regulus	W.	24 55 59	2283	26 42 23	2287	28 28 42	2290	30 14 56	2294
	Spica	E.	29 7 50	2289	27 21 34	2292	25 35 23	2297	23 49 19	2302
	Antares	E.	75 0 7	2283	73 13 42	2286	71 27 22	2290	69 41 8	2294
	Jupiter	E.	100 35 27	2296	98 49 21	2298	97 3 19	2302	95 17 22	2306
25	Pollux	W.	75 59 3	2324	77 44 27	2331	79 29 42	2337	81 14 48	2343
	Regulus	W.	39 4 29	2319	40 50 1	2325	42 35 24	2331	44 20 38	2338
	Antares	E.	60 51 32	2319	59 6 0	2325	57 20 37	2331	55 35 23	2338
	Jupiter	E.	86 29 12	2330	84 43 56	2336	82 58 49	2342	81 13 51	2349
26	Pollux	W.	89 57 45	2382	91 41 46	2391	93 25 34	2400	95 9 9	2409
	Regulus	W.	53 4 12	2376	54 48 21	2385	56 32 17	2394	58 16 0	2403
	Antares	E.	46 51 49	2377	45 7 41	2385	43 23 45	2394	41 40 2	2403
	Jupiter	E.	72 31 39	2389	70 47 48	2397	69 4 9	2407	67 20 44	2416
	α Aquilæ	E.	99 28 41	3134	98 1 13	3136	96 33 47	3139	95 6 25	3144
	Mars	E.	104 35 43	2574	102 56 13	2583	101 16 55	2593	99 37 50	2603
27	Regulus	W.	66 51 7	2455	68 33 24	2466	70 15 25	2477	71 57 10	2489
	Antares	E.	33 4 57	2455	31 22 41	2466	29 40 40	2478	27 58 56	2489
	Jupiter	E.	58 47 14	2470	57 5 19	2482	55 23 40	2494	53 42 19	2507
	α Aquilæ	E.	87 51 44	3193	86 25 26	3207	84 59 25	3221	83 33 41	3236
	Mars	E.	91 25 54	2656	89 48 15	2667	88 10 51	2679	86 33 43	2692
28	Regulus	W	80 21 48	2550	82 1 52	2562	83 41 39	2575	85 21 8	2589
	Spica	W.	26 22 17	2556	28 2 12	2568	29 41 51	2581	31 21 12	2593
	Jupiter	E.	45 20 3	2574	43 40 33	2590	42 1 24	2605	40 22 35	2621
	α Aquilæ	E.	76 30 26	3342	75 7 3	3367	73 44 9	3393	72 21 44	3421
	Mars	E.	78 32 12	2755	76 56 45	2768	75 21 35	2782	73 46 43	2795
29	Regulus	W.	93 33 58	2655	95 11 38	2669	96 48 59	2683	98 26 2	2696
	Spica	W.	39 33 36	2659	41 11 11	2672	42 48 29	2685	44 25 29	2699
	Jupiter	E.	32 14 3	2706	30 37 31	2726	29 1 26	2747	27 25 48	2769
	α Aquilæ	E.	65 38 16	3589	64 19 30	3628	63 1 26	3670	61 44 7	3714
	Mars	E.	65 56 53	2865	64 23 49	2880	62 51 4	2894	61 18 37	2908
	Saturn	E.	105 24 12	2689	103 47 18	2704	102 10 43	2717	100 34 26	2731
30	Spica	W.	52 25 57	2766	54 1 10	2779	55 36 6	2792	57 10 44	2806
	Mars	E.	53 40 51	2978	52 10 11	2992	50 39 48	3005	49 9 42	3019
	α Aquilæ	E.	55 30 3	3978	54 18 2	4041	53 7 3	4109	51 57 10	4180
	Fomalhaut	E.	76 34 18	3066	75 5 27	3084	73 36 58	3102	72 8 51	3120
	Saturn	E.	92 37 30	2798	91 3 0	2811	89 28 47	2825	87 54 51	2838
	α Pegasi	E.	98 25 41	2990	96 55 16	3001	95 25 5	3014	93 55 9	3026

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22	Spica E.	50° 27′ 40″	2267	48° 40′ 52″	2267	46° 54′ 4″	2268	45° 7′ 17″	2268
	Antares E.	96 20 56	2265	94 34 5	2265	92 47 14	2265	91 0 23	2266
23	Sun W.	132 1 8	2602	133 40 0	2607	135 18 46	2610	136 57 27	2615
	Aldebaran W.	97 45 40	2348	99 30 29	2351	101 15 14	2355	102 59 54	2358
	Pollux W.	54 46 2	2280	56 32 31	2282	58 18 57	2284	60 5 20	2286
	Spica E.	36 13 44	2277	34 27 10	2279	32 40 39	2281	30 54 12	2285
	Antares E.	82 6 28	2272	80 19 47	2274	78 33 10	2277	76 46 36	2280
	Jupiter E.	107 40 27	2287	105 54 8	2288	104 7 51	2290	102 21 37	2293
24	Pollux W.	68 56 10	2304	70 42 4	2309	72 27 51	2313	74 13 31	2319
	Regulus W.	32 1 4	2298	33 47 6	2303	35 33 1	2308	37 18 49	2313
	Spica E.	22 3 23	2309	20 17 36	2315	18 31 58	2322	16 46 31	2331
	Antares E.	67 54 59	2298	66 8 57	2302	64 23 1	2308	62 37 13	2313
	Jupiter E.	93 31 31	2310	91 45 46	2314	90 0 7	2320	88 14 36	2324
25	Pollux W.	82 59 45	2350	84 44 31	2357	86 29 7	2365	88 13 32	3373
	Regulus W.	46 5 42	2345	47 50 36	2353	49 35 19	2360	51 19 51	2368
	Antares E.	53 50 19	2345	52 5 25	2353	50 20 42	2360	48 36 10	2368
	Jupiter E.	79 29 3	2356	77 44 25	2364	75 59 58	2372	74 15 43	2380
26	Pollux W.	96 52 31	2419	98 35 39	2429	100 18 33	2439	102 1 12	2450
	Regulus W.	59 59 30	2413	61 42 46	2423	63 25 48	2433	65 8 35	2444
	Antares E.	39 56 32	2413	38 13 16	2424	36 30 15	2434	34 47 29	2444
	Jupiter E.	65 37 32	2426	63 54 35	2436	62 11 52	2448	60 29 25	2459
	α Aquilæ E.	93 39 9	3151	92 12 1	3159	90 45 3	3169	89 18 17	3180
	Mars E.	97 58 59	2612	96 20 21	2623	94 41 57	2634	93 3 48	2645
27	Regulus W.	73 38 39	2501	75 19 51	2512	77 0 47	2525	78 41 26	2537
	Antares E.	26 17 28	2502	24 36 17	2514	22 55 23	2526	21 14 46	2538
	Jupiter E.	52 1 15	2520	50 20 29	2533	48 40 1	2546	46 59 52	2561
	α Aquilæ E.	82 8 17	3256	80 43 14	3275	79 18 33	3296	77 54 17	3318
	Mars E.	84 56 52	2704	83 20 17	2716	81 43 58	2729	80 7 56	2742
28	Regulus W.	87 0 18	2602	88 39 10	2615	90 17 44	2629	91 56 0	2642
	Spica W.	33 0 16	2606	34 39 3	2619	36 17 32	2632	37 55 43	2646
	Jupiter E.	38 44 8	2636	37 6 2	2653	35 28 19	2670	33 50 59	2688
	α Aquilæ E.	70 59 51	3451	69 38 32	3483	68 17 49	3516	66 57 43	3552
	Mars E.	72 12 9	2809	70 37 53	2823	69 3 55	2837	67 30 15	2851
29	Regulus W.	100 2 47	2710	101 39 14	2723	103 15 23	2737	104 51 14	2750
	Spica W.	46 2 10	2713	47 38 33	2725	49 14 39	2739	50 50 27	2753
	Jupiter E.	25 50 39	2792	24 16 1	2818	22 41 57	2846	21 8 29	2878
	α Aquilæ E.	60 27 35	3761	59 11 52	3811	57 57 1	3863	56 43 4	3919
	Mars E.	59 46 28	2922	58 14 37	2936	56 43 4	2950	55 11 49	2964
	Saturn E.	98 58 27	2744	97 22 46	2758	95 47 23	2772	94 12 18	2785
30	Spica W.	58 45 6	2818	60 19 11	2830	61 53 0	2843	63 26 32	2855
	Mars E.	47 39 53	3033	46 10 21	3046	44 41 5	3059	43 12 5	3072
	α Aquilæ E.	50 48 25	4256	49 40 52	4340	48 34 36	4428	47 29 40	4523
	Fomalhaut E.	70 41 6	3140	69 13 45	3159	67 46 47	3179	66 20 13	3200
	Saturn E.	86 21 13	2851	84 47 51	2864	83 14 46	2876	81 41 57	2888
	α Pegasi E.	92 25 28	3038	90 56 2	3051	89 26 52	3063	87 57 57	3076

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	THE SUN'S Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be subtracted from Apparent Time.*	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	2 35 0.38	9.545	N.15 11 44.9	+45.12	15 54.11	66.09	3 3.43	0.310
Wed.	2	2 38 49.75	9.568	15 29 40.4	44.49	15 53.87	66.17	3 10.60	0.287
Thur.	3	2 42 39.68	9.591	15 47 20.5	43.85	15 53.63	66.25	3 17.21	0.264
Frid.	4	2 46 30.17	9.615	16 4 45.2	43.20	15 53.40	66.33	3 23.26	0.240
Sat.	5	2 50 21.23	9.639	16 21 54.0	42.53	15 53.17	66.41	3 28.73	0.216
Sun.	6	2 54 12.88	9.664	16 38 46.7	41.85	15 52.94	66.49	3 33.62	0.191
Mon.	7	2 58 5.13	9.689	16 55 22.9	41.16	15 52.71	66.57	3 37.92	0.167
Tues.	8	3 1 57.97	9.714	17 11 42.4	40.45	15 52.49	66.65	3 41.63	0.142
Wed.	9	3 5 51.39	9.738	17 27 44.7	39.73	15 52.27	66.73	3 44.75	0.118
Thur.	10	3 9 45.40	9.763	17 43 29.5	39.00	15 52.06	66.81	3 47.29	0.093
Frid.	11	3 13 40.00	9.787	17 58 56.7	38.25	15 51.85	66.89	3 49.24	0.069
Sat.	12	3 17 35.18	9.812	18 14 5.7	37.49	15 51.64	66.98	3 50.60	0.044
Sun.	13	3 21 30.94	9.836	18 28 56.3	36.72	15 51.44	67.06	3 51.41	0.020
Mon.	14	3 25 27.27	9.859	18 43 28.2	35.93	15 51.24	67.14	3 51.63	0.003
Tues.	15	3 29 24.17	9.883	18 57 41.1	35.14	15 51.04	67.22	3 51.29	0.027
Wed.	16	3 33 21.63	9.906	19 11 35.0	34.33	15 50.85	67.30	3 50.39	0.050
Thur.	17	3 37 19.65	9.929	19 25 9.2	33.50	15 50.66	67.38	3 48.93	0.073
Frid.	18	3 41 18.21	9.951	19 38 23.5	32.67	15 50.48	67.46	3 46.93	0.095
Sat.	19	3 45 17.31	9.973	19 51 17.6	31.83	15 50.30	67.54	3 44.40	0.117
Sun.	20	3 49 16.94	9.995	20 3 51.5	30.98	15 50.13	67.62	3 41.34	0.139
Mon.	21	3 53 17.09	10.017	20 16 4.9	30.12	15 49.96	67.70	3 37.75	0.161
Tues.	22	3 57 17.76	10.039	20 27 57.5	29.25	15 49.79	67.78	3 33.64	0.182
Wed.	23	4 1 18.94	10.060	20 39 29.1	28.37	15 49.62	67.86	3 29.04	0.203
Thur.	24	4 5 20.62	10.081	20 50 39.4	27.48	15 49.46	67.93	3 23.94	0.224
Frid.	25	4 9 22.79	10.102	21 1 28.3	26.58	15 49.30	68.00	3 18.33	0.245
Sat.	26	4 13 25.46	10.122	21 11 55.4	25.67	15 49.14	68.07	3 12.24	0.265
Sun.	27	4 17 28.60	10.142	21 22 0.5	24.75	15 48.99	68.14	3 5.68	0.285
Mon.	28	4 21 32.21	10.161	21 31 43.6	23.83	15 48.84	68.20	2 58.65	0.304
Tues.	29	4 25 36.29	10.180	21 41 4.7	22.90	15 48.69	68.26	2 51.15	0.323
Wed.	30	4 29 40.82	10.198	21 50 3.3	21.96	15 48.54	68.32	2 43.19	0.341
Thur.	31	4 33 45.79	10.216	21 58 39.1	21.01	15 48.40	68.38	2 34.80	0.359
Frid.	32	4 37 51.91	10.233	N.22 6 52.0	+20.05	15 48.26	68.43	2 25.99	0.376

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Equation of Time, *to be added to Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	2 35 0.86	9.546	N.15 11 47.2	+45.12	3 3.45	0.310	2 38 4.31
Wed.	2	2 38 50.25	9.569	15 29 42.8	44.49	3 10.61	0.287	2 42 0.86
Thur.	3	2 42 40.20	9.592	15 47 23.0	43.85	3 17.22	0.264	2 45 57.42
Frid.	4	2 46 30.71	9.616	16 4 47.7	43.20	3 23.27	0.240	2 49 53.98
Sat.	5	2 50 21.79	9.640	16 21 56.5	42.53	3 28.75	0.216	2 53 50.54
Sun.	6	2 54 13.46	9.665	16 38 49.2	41.85	3 33.63	0.191	2 57 47.09
Mon.	7	2 58 5.72	9.689	16 55 25.4	41.16	3 37.93	0.167	3 1 43.65
Tues.	8	3 1 58.57	9.714	17 11 44.9	40.45	3 41.63	0.142	3 5 40.20
Wed.	9	3 5 52.00	9.738	17 27 47.2	39.73	3 44.76	0.118	3 9 36.76
Thur.	10	3 9 46.02	9.763	17 43 32.0	39.00	3 47.30	0.093	3 13 33.32
Frid.	11	3 13 40.63	9.787	17 58 59.2	38.25	3 49.25	0.069	3 17 29.88
Sat.	12	3 17 35.82	9.812	18 14 8.2	37.49	3 50.61	0.044	3 21 26.43
Sun.	13	3 21 31.58	9.836	18 28 58.7	36.72	3 51.41	0.020	3 25 22.99
Mon.	14	3 25 27.91	9.859	18 43 30.5	35.93	3 51.63	0.003	3 29 19.54
Tues.	15	3 29 24.81	9.883	18 57 43.4	35.14	3 51.29	0.027	3 33 16.10
Wed.	16	3 33 22.27	9.906	19 11 37.2	34.33	3 50.39	0.050	3 37 12.66
Thur.	17	3 37 20.29	9.929	19 25 11.3	33.50	3 48.93	0.073	3 41 9.22
Frid.	18	3 41 18.85	9.951	19 38 25.5	32.67	3 46.92	0.095	3 45 5.77
Sat.	19	3 45 17.94	9.973	19 51 19.6	31.83	3 44.39	0.117	3 49 2.33
Sun.	20	3 49 17.56	9.995	20 3 53.5	30.98	3 41.33	0.139	3 52 58.89
Mon.	21	3 53 17.71	10.017	20 16 6.8	30.12	3 37.74	0.161	3 56 55.45
Tues.	22	3 57 18.37	10.038	20 27 59.3	29.25	3 33.63	0.182	4 0 52.00
Wed.	23	4 1 19.53	10.059	20 39 30.8	28.37	3 29.03	0.203	4 4 48.56
Thur.	24	4 5 21.19	10.080	20 50 41.0	27.48	3 23.93	0.224	4 8 45.12
Frid.	25	4 9 23.36	10.101	21 1 29.8	26.58	3 18.32	0,245	4 12 41.68
Sat.	26	4 13 26.01	10.121	21 11 56.8	25.67	3 12.22	0.265	4 16 38.23
Sun.	27	4 17 29.13	10.141	21 22 1.8	24.75	3 5.66	0.285	4 20 34.79
Mon.	28	4 21 32.72	10.160	21 31 44.9	23.83	2 58.63	0.304	4 24 31.35
Tues.	29	4 25 36.78	10.179	21 41 5.8	22.90	2 51.13	0.323	4 28 27.91
Wed.	30	4 29 41.29	10.197	21 50 4.3	21.96	2 43.17	0.341	4 32 24.46
Thur.	31	4 33 46.24	10.215	21 58 40.0	21.01	2 34.78	0.359	4 36 21.02
Frid.	32	4 37 51.61	10.232	N.22 6 52.9	+20.05	2 25.97	0.376	4 40 17.58

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.
+9s.8565

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	121	41 11 29.7	11 7.8	145.36	−0.30	0.0035756	+45.4	21 18 25.68
2	122	42 9 37.7	9 15.7	145.30	0.26	.0036843	45.1	21 14 29.77
3	123	43 7 44.2	7 22.1	145.24	0.17	.0037923	44.7	21 10 33.85
4	124	44 5 49.3	5 27.0	145.18	−0.08	.0038994	44.3	21 6 37.95
5	125	45 3 53.0	3 30.5	145.12	+0.04	.0040054	43.8	21 2 42.04
6	126	46 1 55.4	1 32.8	145.07	0.17	.0041102	43.3	20 58 46.13
7	127	46 59 56.5	59 33.8	145.01	0.30	.0042136	42.7	20 54 50.22
8	128	47 57 56.2	57 33.3	144.96	0.43	.0043155	42.0	20 50 54.31
9	129	48 55 54.6	55 31.5	144.90	0.56	.0044157	41.3	20 46 58.40
10	130	49 53 51.6	53 28.4	144.84	0.66	.0045141	40.5	20 43 2.50
11	131	50 51 47.2	51 23.8	144.78	0.76	.0046107	39.8	20 39 6.57
12	132	51 49 41.2	49 17.7	144.72	0.81	.0047054	39.0	20 35 10.66
13	133	52 47 33.7	47 10.0	144.66	0.85	.0047981	38.2	20 31 14.75
14	134	53 45 24.8	45 0.9	144.60	0.85	.0048887	37.3	20 27 18.84
15	135	54 43 14.3	42 50.2	144.53	0.80	.0049773	36.5	20 23 22.93
16	136	55 41 2.2	40 38.0	144.46	0.75	.0050639	35.7	20 19 27.02
17	137	56 38 48.6	38 24.3	144.40	0.66	.0051486	35.0	20 15 31.11
18	138	57 36 33.4	36 8.9	144.33	0.56	.0052313	34.2	20 11 35.20
19	139	58 34 16.5	33 51.8	144.27	0.44	.0053129	33.5	20 7 39.28
20	140	59 31 57.9	31 33.0	144.20	0.31	.0053925	32.8	20 3 43.37
21	141	60 29 37.8	29 12.7	144.14	0.18	.0054705	32.2	19 59 47.46
22	142	61 27 16.2	26 50.9	144.07	+0.05	.0055470	31.6	19 55 51.55
23	143	62 24 53.1	24 27.6	144.01	−0.06	.0056223	31.0	19 51 55.63
24	144	63 22 28.5	22 2.9	143.95	0.17	.0056964	30.5	19 47 59.72
25	145	64 20 2.6	19 36.8	143.89	0.24	.0057692	30.0	19 44 3.81
26	146	65 17 35.4	17 9.4	143.84	0.29	.0058408	29.5	19 40 7.90
27	147	66 15 7.0	14 40.8	143.79	0.29	.0059113	29.1	19 36 11.99
28	148	67 12 37.4	12 11.1	143.75	0.28	.0059807	28.7	19 32 16.08
29	149	68 10 6.9	9 40.4	143.71	0.23	.0060490	28.2	19 28 20.17
30	150	69 7 35.5	7 8.8	143.67	0.16	.0061161	27.7	19 24 24.26
31	151	70 5 3.2	4 36.3	143.63	−0.06	.0061820	27.2	19 20 28.34
32	152	71 2 30.1	2 3.0	143.60	+0.04	0.0062466	+26.6	19 16 32.43

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
−9s.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 8.1	15 3.7	55 26.0	−1.41	55 9.9	−1.27	15 43.4	2.22	17.8
2	14 59.8	14 56.4	54 55.5	1.12	54 43.1	0.95	16 35 2	2.10	18.8
3	14 53.6	14 51.4	54 32.8	0.77	54 24.8	0.56	17 24.0	1.96	19.8
4	14 50.0	14 49.1	54 19.3	−0.36	54 16.3	−0.15	18 9.6	1.84	20.8
5	14 49.0	14 49.6	54 15.8	+0.07	54 18.0	+0.29	18 52.6	1.74	21.8
6	14 50.9	14 52.9	54 22.7	0.50	54 30.0	0.71	19 33.7	1.69	22.8
7	14 55.5	14 58.7	54 39.6	0.91	54 51.6	1.09	20 14.1	1.68	23.8
8	15 2.6	15 6.9	55 5.7	1.25	55 21.6	1.40	20 54.8	1.72	24.8
9	15 11.6	15 16.8	55 39.1	1.52	55 57.9	1.61	21 37.1	1.82	25.8
10	15 22.2	15 27.7	56 17.8	1.69	56 38.2	1.72	22 22.8	1.96	26.8
11	15 33.4	15 39.0	56 58.9	1.73	57 19.5	1.70	23 11.5	2.15	27.8
12	15 44.4	15 49.6	57 39.5	1.63	57 58.6	1.55	6		28.8
13	15 54.5	15 58.9	58 16.5	1.43	58 32.8	1.29	0 5.6	2.37	0.3
14	16 2.9	16 6.3	58 47.3	1.12	58 59.7	0.95	1 4.5	2.54	1.3
15	16 9.1	16 11.3	59 10.1	0.77	59 18.2	0.59	2 6.8	2.63	2.3
16	16 13.0	16 14.0	59 24.2	0.41	59 28.0	+0.23	3 9.8	2.60	3.3
17	16 14.5	16 14.5	59 29.8	+0.07	59 29.7	−0.09	4 10.7	2.44	4.3
18	16 13.9	16 13.0	59 27.8	−0.22	59 24.4	0.35	5 7.7	2.27	5.3
19	16 11.6	16 10.0	59 19.5	0.46	59 13.4	0.56	6 0.6	2.11	6.3
20	16 8.0	16 5.7	59 6.1	0.65	58 57.8	0.73	6 50.0	2.00	7.3
21	16 3.3	16 0.6	58 48.7	0.79	58 38.8	0.86	7 37.2	1.94	8.3
22	15 57.6	15 54.5	58 28.0	0.93	58 16.4	1.00	8 23.7	1.94	9.3
23	15 51.1	15 47.5	58 4.1	1.06	57 51.0	1.12	9 10.7	1.99	10.3
24	15 43.8	15 39.9	57 37.3	1.17	57 22.9	1.22	9 59.3	2.07	11.3
25	15 35.9	15 31.7	57 8.0	1.26	56 52.7	1.29	10 50.2	2.17	12.3
26	15 27.4	15 23.1	56 37.0	1.32	56 21.1	1.32	11 43.5	2.26	13.3
27	15 18.8	15 14.5	56 5.3	1.31	55 49.7	1.29	12 38.3	2.29	14.3
28	15 10.4	15 6.4	55 34.5	1.24	55 19.9	1.19	13 33.1	2.26	15.3
29	15 2.7	14 59.2	55 6.1	1.11	54 53.4	1.00	14 26.2	2.16	16.3
30	14 56.2	14 53.5	54 42.1	0.88	54 32.4	0.74	15 16.5	2.03	17.3
31	14 51.3	14 49.6	54 24.4	0.59	54 18.3	0.42	16 3.5	1.89	18.3
32	14 48.6	14 48.2	54 14.4	−0.23	54 12.8	−0.04	16 47.4	1.77	19.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 47 23.17	2.3502	S.28 13 40.8	0.203
1	17 49 44.11	2.3478	28 13 24.1	0.354
2	17 52 4.91	2.3454	28 12 58.3	0.505
3	17 54 25.56	2.3428	28 12 23.5	0.654
4	17 56 46.05	2.3402	28 11 39.8	0.803
5	17 59 6.38	2.3374	28 10 47.2	0.952
6	18 1 26.54	2.3345	28 9 45.6	1.100
7	18 3 46.52	2.3316	28 8 35.2	1.247
8	18 6 6.33	2.3287	28 7 16.0	1.393
9	18 8 25.96	2.3256	28 5 48.0	1.540
10	18 10 45.40	2.3223	28 4 11.2	1.686
11	18 13 4.64	2.3191	28 2 25.7	1.831
12	18 15 23.69	2.3158	28 0 31.5	1.975
13	18 17 42.54	2.3123	27 58 28.7	2.118
14	18 20 1.17	2.3088	27 56 17.3	2.262
15	18 22 19.59	2.3052	27 53 57.3	2.404
16	18 24 37.79	2.3015	27 51 28.8	2.546
17	18 26 55.77	2.2978	27 48 51.8	2.687
18	18 29 13.53	2.2941	27 46 6.3	2.828
19	18 31 31.06	2.2902	27 43 12.4	2.968
20	18 33 48.35	2.2862	27 40 10.2	3.106
21	18 36 5.40	2.2822	27 36 59.7	3.243
22	18 38 22.21	2.2781	27 33 41.0	3.381
23	18 40 38.77	2.2740	S.27 30 14.0	3.518

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 42 55.09	2.2699	S.27 26 38.8	3.654
1	18 45 11.16	2.2656	27 22 55.5	3.788
2	18 47 26.96	2.2612	27 19 4.2	3.923
3	18 49 42.50	2.2568	27 15 4.8	4.057
4	18 51 57.78	2.2524	27 10 57.4	4.189
5	18 54 12.79	2.2479	27 6 42.1	4.321
6	18 56 27.53	2.2434	27 2 18.9	4.452
7	18 58 42.00	2.2388	26 57 47.9	4.582
8	19 0 56.19	2.2343	26 53 9.1	4.711
9	19 3 10.11	2.2297	26 48 22.6	4.839
10	19 5 23.75	2.2249	26 43 28.4	4.967
11	19 7 37.10	2.2201	26 38 26.6	5.093
12	19 9 50.16	2.2153	26 33 17.3	5.218
13	19 12 2.94	2.2106	26 28 0.4	5.344
14	19 14 15.43	2.2057	26 22 36.0	5.468
15	19 16 27.62	2.2008	26 17 4.3	5.590
16	19 18 39.52	2.1958	26 11 25.2	5.712
17	19 20 51.12	2.1909	26 5 38.8	5.834
18	19 23 2.43	2.1860	25 59 45.1	5.955
19	19 25 13.44	2.1810	25 53 44.2	6.074
20	19 27 24.15	2.1760	25 47 36.2	6.192
21	19 29 34.56	2.1709	25 41 21.2	6.309
22	19 31 44.66	2.1658	25 34 59.1	6.427
23	19 33 54.46	2.1608	25 28 30.0	6.543
24	19 36 3.96	2.1557	S.25 21 54.0	6.657

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 36 3.96	2.1557	S.25 21 54.0	6.657
1	19 38 13.15	2.1506	25 15 11.2	6.771
2	19 40 22.03	2.1455	25 8 21.5	6.884
3	19 42 30.61	2.1404	25 1 25.1	6.996
4	19 44 38.88	2.1352	24 54 22.0	7.107
5	19 46 46.84	2.1301	24 47 12.2	7.217
6	19 48 54.49	2.1249	24 39 55.9	7.327
7	19 51 1.83	2.1198	24 32 33.0	7.435
8	19 53 8.87	2.1147	24 25 3.7	7.543
9	19 55 15.60	2.1096	24 17 27.9	7.650
10	19 57 22.02	2.1044	24 9 45.7	7.755
11	19 59 28.13	2.0993	24 1 57.3	7.859
12	20 1 33.93	2.0942	23 54 2.6	7.963
13	20 3 39.43	2.0891	23 46 1.7	8.067
14	20 5 44.62	2.0839	23 37 54.6	8.168
15	20 7 49.50	2.0788	23 29 41.5	8.269
16	20 9 54.07	2.0737	23 21 22.3	8.370
17	20 11 58.34	2.0687	23 12 57.1	8.468
18	20 14 2.32	2.0637	23 4 26.1	8.566
19	20 16 5.99	2.0586	22 55 49.2	8.664
20	20 18 9.35	2.0535	22 47 6.4	8.761
21	20 20 12.41	2.0485	22 38 17.9	8.856
22	20 22 15.17	2.0436	22 29 23.7	8.951
23	20 24 17.64	2.0387	S.22 20 23.8	9.045

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 26 19.81	2.0337	S.22 11 18.3	9.138
1	20 28 21.68	2.0288	22 2 7.2	9.230
2	20 30 23.26	2.0239	21 52 50.7	9.320
3	20 32 24.55	2.0191	21 43 28.8	9.410
4	20 34 25.55	2.0142	21 34 1.5	9.500
5	20 36 26.26	2.0094	21 24 28.8	9.589
6	20 38 26.68	2.0047	21 14 50.8	9.677
7	20 40 26.82	2.0000	21 5 7.6	9.763
8	20 42 26.68	1.9953	20 55 19.2	9.849
9	20 44 26.25	1.9906	20 45 25.7	9.934
10	20 46 25.55	1.9860	20 35 27.1	10.018
11	20 48 24.57	1.9813	20 25 23.5	10.101
12	20 50 23.31	1.9767	20 15 15.0	10.183
13	20 52 21.78	1.9723	20 5 1.6	10.265
14	20 54 19.99	1.9679	19 54 43.2	10.347
15	20 56 17.93	1.9635	19 44 20.0	10.426
16	20 58 15.61	1.9591	19 33 52.1	10.504
17	21 0 13.02	1.9547	19 23 19.5	10.583
18	21 2 10.17	1.9504	19 12 42.1	10.661
19	21 4 7.07	1.9462	19 2 0.1	10.737
20	21 6 3.71	1.9419	18 51 13.6	10.813
21	21 8 0.10	1.9377	18 40 22.5	10.889
22	21 9 56.24	1.9337	18 29 26.9	10.963
23	21 11 52.14	1.9297	18 18 26.9	11.036
24	21 13 47.80	1.9257	S.18 7 22.6	11.108

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 5.			
	h m s	s	° ′ ″	″
0	21 13 47.80	1.9257	S. 18 7 22.6	11.108
1	21 15 43.22	1.9217	17 56 13.9	11.181
2	21 17 38.40	1.9178	17 45 0.9	11.252
3	21 19 33.35	1.9139	17 33 43.7	11.322
4	21 21 28.07	1.9101	17 22 22.3	11.392
5	21 23 22.56	1.9063	17 10 56.7	11.461
6	21 25 16.83	1.9027	16 59 27.0	11.529
7	21 27 10.88	1.8990	16 47 53.3	11.596
8	21 29 4.71	1.8954	16 36 15.5	11.663
9	21 30 58.33	1.8919	16 24 33.8	11.728
10	21 32 51.74	1.8884	16 12 48.2	11.793
11	21 34 44.94	1.8850	16 0 58.7	11.858
12	21 36 37.94	1.8817	15 49 5.3	11.922
13	21 38 30.74	1.8783	15 37 8.1	11.983
14	21 40 23.34	1.8751	15 25 7.3	12.044
15	21 42 15.75	1.8719	15 13 2.8	12.106
16	21 44 7.97	1.8688	15 0 54.6	12.167
17	21 46 0.01	1.8657	14 48 42.8	12.227
18	21 47 51.86	1.8627	14 36 27.4	12.286
19	21 49 43.53	1.8598	14 24 8.5	12.343
20	21 51 35.03	1.8570	14 11 46.2	12.401
21	21 53 26.37	1.8542	13 59 20.4	12.458
22	21 55 17.54	1.8514	13 46 51.2	12.514
23	21 57 8.54	1.8486	S. 13 34 18.7	12.570
	SUNDAY 6.			
0	21 58 59.37	1.8459	S. 13 21 42.8	12.625
1	22 0 50.05	1.8434	13 9 3.7	12.678
2	22 2 40.58	1.8410	12 56 21.4	12.732
3	22 4 30.97	1.8386	12 43 35.9	12.784
4	22 6 21 21	1.8362	12 30 47.3	12.836
5	22 8 11.31	1.8339	12 17 55.6	12.887
6	22 10 1.28	1.8317	12 5 0.8	12.938
7	22 11 51.11	1.8295	11 52 3.0	12.988
8	22 13 40.82	1.8274	11 39 2.3	13.037
9	22 15 30.40	1.8253	11 25 58.6	13.086
10	22 17 19.86	1.8234	11 12 52.0	13.133
11	22 19 9.21	1.8216	10 59 42.6	13.180
12	22 20 58.45	1.8198	10 46 30.4	13.226
13	22 22 47.58	1.8180	10 33 15.5	13.272
14	22 24 36.61	1.8163	10 19 57.8	13.317
15	22 26 25.53	1.8146	10 6 37.4	13.362
16	22 28 14.36	1.8131	9 53 14.4	13.405
17	22 30 3.10	1.8117	9 39 48.8	13.448
18	22 31 51.76	1.8103	9 26 20.6	13.491
19	22 33 40.33	1.8089	9 12 49.9	13.532
20	22 35 28.83	1.8077	8 59 16.7	13.573
21	22 37 17.25	1.8064	8 45 41.1	13.613
22	22 39 5.60	1.8053	8 32 3.1	13.652
23	22 40 53.89	1.8043	8 18 22.8	13.691
24	22 42 42.12	1.8033	S. 8 4 40.2	13.729

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 7.			
	h m s	s	° ′ ″	″
0	22 42 42.12	1.8033	S. 8 4 40.2	13.729
1	22 44 30.29	1.8024	7 50 55.3	13.767
2	22 46 18.41	1.8016	7 37 8.2	13.803
3	22 48 6.48	1.8008	7 23 18.9	13.839
4	22 49 54.51	1.8002	7 9 27.5	13.875
5	22 51 42.50	1.7995	6 55 33.9	13.911
6	22 53 30.45	1.7989	6 41 38.2	13.945
7	22 55 18.37	1.7985	6 27 40.5	13.978
8	22 57 6.27	1.7982	6 13 40.9	14.010
9	22 58 54.15	1.7978	5 59 39.3	14.042
10	23 0 42.01	1.7976	5 45 35.8	14.073
11	23 2 29.86	1.7974	5 31 30.5	14.104
12	23 4 17.70	1.7973	5 17 23.3	14.135
13	23 6 5.54	1.7973	5 3 14.3	14.164
14	23 7 53.38	1.7973	4 49 3.6	14.192
15	23 9 41.22	1.7974	4 34 51.3	14.218
16	23 11 29.07	1.7977	4 20 37.4	14.246
17	23 13 16.94	1.7980	4 6 21.8	14.273
18	23 15 4.83	1.7983	3 52 4.6	14.299
19	23 16 52.74	1.7987	3 37 45.9	14.323
20	23 18 40.68	1.7993	3 23 25.8	14.347
21	23 20 28.66	1.8000	3 9 4.2	14.371
22	23 22 16.68	1.8007	2 54 41.3	14.393
23	23 24 4.74	1.8013	S. 2 40 17.0	14.416
	TUESDAY 8.			
0	23 25 52.84	1.8021	S. 2 25 51.4	14.438
1	23 27 40.99	1.8030	2 11 24.5	14.458
2	23 29 29.20	1.8041	1 56 56.5	14.477
3	23 31 17.48	1.8052	1 42 27.3	14.496
4	23 33 5.82	1.8063	1 27 57.0	14.514
5	23 34 54.23	1.8075	1 13 25.6	14.532
6	23 36 42.72	1.8088	0 58 53.2	14.548
7	23 38 31.29	1.8102	0 44 19.8	14.564
8	23 40 19.94	1.8116	0 29 45.5	14.579
9	23 42 8.68	1.8131	0 15 10.3	14.593
10	23 43 57.51	1.8148	S. 0 0 34.3	14.607
11	23 45 46.45	1.8165	N. 0 14 2.5	14.619
12	23 47 35.49	1.8183	0 28 40.0	14.631
13	23 49 24.64	1.8201	0 43 18.2	14.642
14	23 51 13.90	1.8220	0 57 57.1	14.652
15	23 53 3.28	1.8241	1 12 36.5	14.661
16	23 54 52.79	1.8262	1 27 16.4	14.670
17	23 56 42.42	1.8283	1 41 56.9	14.678
18	23 58 32.18	1.8305	1 56 37.8	14.685
19	0 0 22.08	1.8328	2 11 19.1	14.691
20	0 2 12.12	1.8353	2 26 0.7	14.696
21	0 4 2.31	1.8378	2 40 42.6	14.700
22	0 5 52.66	1.8404	2 55 24.7	14.703
23	0 7 43.16	1.8430	3 10 7.0	14.706
24	0 9 33.82	1.8457	N. 3 24 49.4	14.707

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 9 33.82	1.8457	N. 3 24 49.4	14.707
1	0 11 24.65	1.8486	3 39 31.8	14.707
2	0 13 15.65	1.8515	3 54 14.3	14.707
3	0 15 6.83	1.8545	4 8 56.7	14.706
4	0 16 58.19	1.8576	4 23 39.0	14.704
5	0 18 49.74	1.8607	4 38 21.2	14.701
6	0 20 41.47	1.8638	4 53 3.1	14.696
7	0 22 33.40	1.8672	5 7 44.7	14.691
8	0 24 25.54	1.8707	5 22 26.0	14.686
9	0 26 17.88	1.8741	5 37 7.0	14.679
10	0 28 10.43	1.8777	5 51 47.5	14.671
11	0 30 3.20	1.8813	6 6 27.5	14.661
12	0 31 56.19	1.8850	6 21 6.8	14.650
13	0 33 49.40	1.8888	6 35 45.5	14.639
14	0 35 42.85	1.8927	6 50 23.5	14.627
15	0 37 36.53	1.8967	7 5 0.8	14.615
16	0 39 30.45	1.9008	7 19 37.3	14.600
17	0 41 24.62	1.9049	7 34 12.8	14.584
18	0 43 19.04	1.9091	7 48 47.4	14.568
19	0 45 13.71	1.9134	8 3 21.0	14.551
20	0 47 8.65	1.9178	8 17 53.5	14.532
21	0 49 3.85	1.9223	8 32 24.8	14.512
22	0 50 59.32	1.9268	8 46 54.9	14.491
23	0 52 55.07	1.9314	N. 9 1 23.7	14.469

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 54 51.09	1.9361	N. 9 15 51.2	14.446
1	0 56 47.40	1.9409	9 30 17.2	14.421
2	0 58 44.00	1.9458	9 44 41.7	14.396
3	1 0 40.89	1.9507	9 59 4.7	14.369
4	1 2 38.08	1.9557	10 13 26.0	14.341
5	1 4 35.57	1.9608	10 27 45.6	14.312
6	1 6 33.37	1.9660	10 42 3.4	14.281
7	1 8 31.49	1.9712	10 56 19.3	14.249
8	1 10 29.92	1.9765	11 10 33.3	14.217
9	1 12 28.67	1.9819	11 24 45.3	14.183
10	1 14 27.75	1.9874	11 38 55.2	14.146
11	1 16 27.16	1.9929	11 53 2.9	14.109
12	1 18 26.90	1.9986	12 7 8.3	14.071
13	1 20 26.99	2.0043	12 21 11.4	14.032
14	1 22 27.42	2.0101	12 35 12.2	13.992
15	1 24 28.20	2.0159	12 49 10.4	13.949
16	1 26 29.33	2.0219	13 3 6.0	13.905
17	1 28 30.83	2.0280	13 16 59.0	13.861
18	1 30 32.69	2.0341	13 30 49.3	13.815
19	1 32 34.92	2.0402	13 44 36.8	13.767
20	1 34 37.52	2.0464	13 58 21.4	13.717
21	1 36 40.49	2.0527	14 12 2.9	13.666
22	1 38 43.84	2.0591	14 25 41.3	13.614
23	1 40 47.58	2.0656	14 39 16.6	13.562
24	1 42 51.71	2.0721	N.14 52 48.7	13.507

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 42 51.71	2.0721	N.14 52 48.7	13.507
1	1 44 56.23	2.0787	15 6 17.4	13.450
2	1 47 1.15	2.0853	15 19 42.7	13.392
3	1 49 6.46	2.0919	15 33 4.4	13.332
4	1 51 12.18	2.0987	15 46 22.5	13.271
5	1 53 18.31	2.1056	15 59 36.9	13.209
6	1 55 24.85	2.1126	16 12 47.6	13.146
7	1 57 31.81	2.1195	16 25 54.4	13.079
8	1 59 39.19	2.1264	16 38 57.1	13.011
9	2 1 46.98	2.1334	16 51 55.7	12.942
10	2 3 55.20	2.1406	17 4 50.1	12.872
11	2 6 3.85	2.1478	17 17 40.3	12.800
12	2 8 12.94	2.1551	17 30 26.1	12.726
13	2 10 22.46	2.1623	17 43 7.4	12.651
14	2 12 32.42	2.1697	17 55 44.2	12.574
15	2 14 42.82	2.1771	18 8 16.3	12.495
16	2 16 53.67	2.1845	18 20 43.6	12.415
17	2 19 4.96	2.1919	18 33 6.1	12.333
18	2 21 16.70	2.1994	18 45 23.6	12.249
19	2 23 28.89	2.2070	18 57 36.0	12.164
20	2 25 41.54	2.2147	19 9 43.3	12.077
21	2 27 54.65	2.2223	19 21 45.3	11.988
22	2 30 8.22	2.2300	19 33 41.9	11.897
23	2 32 22.25	2.2377	N.19 45 33.0	11.805

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 34 36.74	2.2454	N.19 57 18.5	11.711
1	2 36 51.70	2.2532	20 8 58.3	11.615
2	2 39 7.12	2.2609	20 20 32.3	11.518
3	2 41 23.01	2.2687	20 32 0.5	11.420
4	2 43 39.37	2.2766	20 43 22.7	11.318
5	2 45 56.20	2.2843	20 54 38.7	11.215
6	2 48 13.49	2.2922	21 5 48.5	11.111
7	2 50 31.26	2.3001	21 16 52.0	11.004
8	2 52 49.50	2.3080	21 27 49.0	10.896
9	2 55 8.22	2.3159	21 38 39.5	10.786
10	2 57 27.41	2.3238	21 49 23.3	10.674
11	2 59 47.07	2.3317	22 0 0.4	10.561
12	3 2 7.21	2.3396	22 10 30.6	10.445
13	3 4 27.82	2.3475	22 20 53.8	10.328
14	3 6 48.91	2.3554	22 31 9.9	10.209
15	3 9 10.47	2.3632	22 41 18.9	10.089
16	3 11 32.50	2.3711	22 51 20.6	9.967
17	3 13 55.00	2.3790	23 1 14.9	9.842
18	3 16 17.98	2.3869	23 11 1.6	9.715
19	3 18 41.43	2.3947	23 20 40.7	9.587
20	3 21 5.34	2.4024	23 30 12.1	9.458
21	3 23 29.72	2.4102	23 39 35.7	9.327
22	3 25 54.56	2.4179	23 48 51.3	9.193
23	3 28 19.86	2.4256	23 57 58.9	9.058
24	3 30 45.63	2.4332	N.24 6 58.3	8.921

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 30 45.63	2.4339	N.24 6 58.3	8.921
1	3 33 11.85	2.4408	24 15 49.4	8.782
2	3 35 38.53	2.4484	24 24 32.2	8.642
3	3 38 5.66	2.4559	24 33 6.5	8.500
4	3 40 33.24	2.4634	24 41 32.2	8.356
5	3 43 1.27	2.4708	24 49 49.2	8.211
6	3 45 29.74	2.4782	24 57 57.5	8.064
7	3 47 58.65	2.4854	25 5 56.9	7.915
8	3 50 27.99	2.4926	25 13 47.3	7.763
9	3 52 57.76	2.4997	25 21 28.5	7.611
10	3 55 27.96	2.5067	25 29 0.6	7.458
11	3 57 58.57	2.5137	25 36 23.5	7.302
12	4 0 29.60	2.5206	25 43 36.9	7.144
13	4 3 1.04	2.5273	25 50 40.8	6.986
14	4 5 32.88	2.5341	25 57 35.2	6.827
15	4 8 5.13	2.5407	26 4 20.0	6.665
16	4 10 37.77	2.5472	26 10 55.0	6.501
17	4 13 10.79	2.5536	26 17 20.1	6.336
18	4 15 44.20	2.5599	26 23 35.3	6.169
19	4 18 17.98	2.5661	26 29 40.4	6.001
20	4 20 52.13	2.5722	26 35 35.4	5.832
21	4 23 26.64	2.5781	26 41 20.3	5.662
22	4 26 1.50	2.5838	26 46 54.9	5.490
23	4 28 36.70	2.5896	N.26 52 19.1	5.316

MONDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 31 12.25	2.5952	N.26 57 32.8	5.140
1	4 33 48.13	2.6007	27 2 35.9	4.964
2	4 36 24.33	2.6059	27 7 28.5	4.788
3	4 39 0.84	2.6111	27 12 10.5	4.610
4	4 41 37.66	2.6161	27 16 41.7	4.430
5	4 44 14.77	2.6209	27 21 2.1	4.248
6	4 46 52.17	2.6257	27 25 11.5	4.066
7	4 49 29.85	2.6303	27 29 10.0	3.883
8	4 52 7.80	2.6347	27 32 57.5	3.699
9	4 54 46.01	2.6389	27 36 33.9	3.514
10	4 57 24.47	2.6430	27 39 59.2	3.327
11	5 0 3.17	2.6469	27 43 13.2	3.139
12	5 2 42.10	2.6507	27 46 15.9	2.951
13	5 5 21.25	2.6542	27 49 7.3	2.762
14	5 8 0.61	2.6577	27 51 47.4	2.573
15	5 10 40.18	2.6611	27 54 16.1	2.382
16	5 13 19.94	2.6641	27 56 33.3	2.191
17	5 15 59.87	2.6669	27 58 39.0	1.999
18	5 18 39.97	2.6697	28 0 33.2	1.807
19	5 21 20.23	2.6723	28 2 15.8	1.613
20	5 24 0.64	2.6747	28 3 46.8	1.419
21	5 26 41.19	2.6768	28 5 6.1	1.224
22	5 29 21.86	2.6788	26 6 13.7	1.029
23	5 32 2.64	2.6806	28 7 9.6	0.835
24	5 34 43.53	2.6822	N.28 7 53.9	0.640

TUESDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 34 43.53	2.6822	N.28 7 53.9	0.640
1	5 37 24.51	2.6837	28 8 26.4	0.443
2	5 40 5.57	2.6849	28 8 47.1	0.246
3	5 42 46.70	2.6860	28 8 55.9	+0.049
4	5 45 27.89	2.6868	28 8 52.9	−0.147
5	5 48 9.12	2.6875	28 8 38.2	0.343
6	5 50 50.39	2.6880	28 8 11.7	0.541
7	5 53 31.68	2.6883	28 7 33.3	0.738
8	5 56 12.98	2.6884	28 6 43.1	0.935
9	5 58 54.29	2.6884	28 5 41.1	1.132
10	6 1 35.59	2.6881	28 4 27.2	1.330
11	6 4 16.86	2.6876	28 3 1.5	1.527
12	6 6 58.10	2.6869	28 1 24.0	1.723
13	6 9 39.29	2.6861	27 59 34.7	1.920
14	6 12 20.43	2.6852	27 57 33.6	2.117
15	6 15 1.51	2.6840	27 55 20.7	2.312
16	6 17 42.51	2.6826	27 52 56.1	2.508
17	6 20 23.42	2.6810	27 50 19.7	2.704
18	6 23 4.23	2.6792	27 47 31.6	2.899
19	6 25 44.93	2.6773	27 44 31.8	3.093
20	6 28 25.51	2.6752	27 41 20.4	3.287
21	6 31 5.96	2.6730	27 37 57.3	3.481
22	6 33 46.27	2.6706	27 34 22.7	3.673
23	6 36 26.43	2.6679	N.27 30 36.5	3.866

WEDNESDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 39 6.42	2.6651	N.27 26 38.8	4.057
1	6 41 46.24	2.6622	27 22 29.7	4.248
2	6 44 25.88	2.6592	27 18 9.1	4.438
3	6 47 5.34	2.6560	27 13 37.1	4.627
4	6 49 44.60	2.6525	27 8 53.8	4.816
5	6 52 23.64	2.6488	27 3 59.2	5.003
6	6 55 2.46	2.6451	26 58 53.4	5.190
7	6 57 41.05	2.6413	26 53 36.4	5.376
8	7 0 19.41	2.6373	26 48 8.3	5.559
9	7 2 57.53	2.6331	26 42 29.3	5.742
10	7 5 35.39	2.6288	26 36 39.3	5.925
11	7 8 12.99	2.6245	26 30 38.3	6.107
12	7 10 50.33	2.6200	26 24 26.5	6.287
13	7 13 27.39	2.6153	26 18 3.9	6.466
14	7 16 4.16	2.6104	26 11 30.6	6.643
15	7 18 40.64	2.6055	26 4 46.7	6.820
16	7 21 16.82	2.6005	25 57 52.2	6.996
17	7 23 52.70	2.5953	25 50 47.2	7.170
18	7 26 28.26	2.5900	25 43 31.8	7.343
19	7 29 3.50	2.5847	25 36 6.1	7.514
20	7 31 38.42	2.5793	25 28 30.1	7.684
21	7 34 13.02	2.5738	25 20 44.0	7.853
22	7 36 47.28	2.5682	25 12 47.8	8.020
23	7 39 21.20	2.5624	25 4 41.6	8.186
24	7 41 54.77	2.5566	N.24 56 25.5	8.350

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 41 54.77	2.5566	N.24 56 25.5	8.350
1	7 44 27.99	2.5507	24 47 59.6	8.513
2	7 47 0.85	2.5447	24 39 24.0	8.674
3	7 49 33.36	2.5387	24 30 38.7	8.834
4	7 52 5.50	2.5326	24 21 43.9	8.992
5	7 54 37.27	2.5264	24 12 39.6	9.149
6	7 57 8.67	2.5202	24 3 26.0	9.304
7	7 59 39.70	2.5139	23 54 3.1	9.457
8	8 2 10.34	2.5075	23 44 31.1	9.609
9	8 4 40.60	2.5011	23 34 50.0	9.759
10	8 7 10.47	2.4946	23 25 0.0	9.908
11	8 9 39.95	2.4882	23 15 1.1	10.055
12	8 12 9.05	2.4817	23 4 53.4	10.201
13	8 14 37.75	2.4751	22 54 37.0	10.344
14	8 17 6.06	2.4685	22 44 12.1	10.486
15	8 19 33.97	2.4618	22 33 38.7	10.627
16	8 22 1.48	2.4552	22 22 56.9	10.765
17	8 24 28.60	2.4487	22 12 6.9	10.902
18	8 26 55.32	2.4420	22 1 8.7	11.037
19	8 29 21.64	2.4352	21 50 2.5	11.170
20	8 31 47.55	2.4285	21 38 48.3	11.303
21	8 34 13.06	2.4218	21 27 26.2	11.433
22	8 36 38.17	2.4151	21 15 56.4	11.561
23	8 39 2.87	2.4083	N.21 4 18.9	11.687

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 41 27.17	2.4017	N.20 52 33.9	11.812
1	8 43 51.07	2.3950	20 40 41.5	11.934
2	8 46 14.57	2.3882	20 28 41.8	12.056
3	8 48 37.66	2.3815	20 16 34.8	12.176
4	8 51 0.35	2.3749	20 4 20.7	12.293
5	8 53 22.65	2.3683	19 51 59.6	12.408
6	8 55 44.55	2.3617	19 39 31.7	12.522
7	8 58 6.05	2.3550	19 26 57.0	12.635
8	9 0 27.15	2.3484	19 14 15.5	12.747
9	9 2 47.86	2.3418	19 1 27.4	12.855
10	9 5 8.17	2.3353	18 48 32.9	12.962
11	9 7 28.10	2.3289	18 35 32.0	13.067
12	9 9 47.64	2.3224	18 22 24.8	13.171
13	9 12 6.79	2.3160	18 9 11.5	13.273
14	9 14 25.56	2.3096	17 55 52.1	13.373
15	9 16 43.94	2.3033	17 42 26.8	13.471
16	9 19 1.95	2.2970	17 28 55.6	13.568
17	9 21 19.58	2.2907	17 15 18.7	13.663
18	9 23 36.83	2.2844	17 1 36.1	13.756
19	9 25 53.71	2.2783	16 47 48.0	13.847
20	9 28 10.23	2.2722	16 33 54.5	13.937
21	9 30 26.38	2.2662	16 19 55.6	14.025
22	9 32 42.17	2.2602	16 5 51.5	14.111
23	9 34 57.61	2.2543	15 51 42.3	14.195
24	9 37 12.69	2.2484	N.15 37 28.1	14.277

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 37 12.69	2.2484	N.15 37 28.1	14.277
1	9 39 27.42	2.2426	15 23 9.0	14.358
2	9 41 41.80	2.2368	15 8 45.1	14.438
3	9 43 55.84	2.2312	14 54 16.4	14.517
4	9 46 9.54	2.2256	14 39 43.1	14.593
5	9 48 22.91	2.2200	14 25 5.3	14.666
6	9 50 35.94	2.2145	14 10 23.2	14.738
7	9 52 48.65	2.2092	13 55 36.7	14.810
8	9 55 1.04	2.2038	13 40 46.0	14.879
9	9 57 13.10	2.1984	13 25 51.2	14.947
10	9 59 24.85	2.1932	13 10 52.4	15.013
11	10 1 36.29	2.1882	12 55 49.6	15.078
12	10 3 47.43	2.1832	12 40 43.0	15.141
13	10 5 58.27	2.1782	12 25 32.7	15.202
14	10 8 8.81	2.1732	12 10 18.8	15.261
15	10 10 19.06	2.1684	11 55 1.4	15.319
16	10 12 29.02	2.1637	11 39 40.5	15.376
17	10 14 38.70	2.1590	11 24 16.3	15.431
18	10 16 48.10	2.1544	11 8 48.8	15.484
19	10 18 57.23	2.1499	10 53 18.2	15.536
20	10 21 6.09	2.1455	10 37 44.5	15.587
21	10 23 14.69	2.1412	10 22 7.8	15.635
22	10 25 23.03	2.1369	10 6 28.3	15.682
23	10 27 31.12	2.1328	N. 9 50 46.0	15.727

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 29 38.96	2.1287	N. 9 35 1.1	15.770
1	10 31 46.56	2.1247	9 19 13.6	15.812
2	10 33 53.92	2.1207	9 3 23.6	15.854
3	10 36 1.05	2.1169	8 47 31.1	15.894
4	10 38 7.95	2.1132	8 31 36.3	15.932
5	10 40 14.63	2.1095	8 15 39.3	15.968
6	10 42 21.09	2.1059	7 59 40.2	16.003
7	10 44 27.34	2.1025	7 43 39.0	16.036
8	10 46 33.39	2.0991	7 27 35.9	16.068
9	10 48 39.23	2.0958	7 11 30.9	16.098
10	10 50 44.88	2.0926	6 55 24.1	16.127
11	10 52 50.34	2.0895	6 39 15.6	16.154
12	10 54 55.62	2.0865	6 23 5.6	16.179
13	10 57 0.72	2.0836	6 6 54.1	16.204
14	10 59 5.65	2.0807	5 50 41.1	16.228
15	11 1 10.40	2.0778	5 34 26.7	16.250
16	11 3 14.99	2.0752	5 18 11.1	16.270
17	11 5 19.42	2.0726	5 1 54.3	16.288
18	11 7 23.70	2.0701	4 45 36.5	16.305
19	11 9 27.83	2.0677	4 29 17.7	16.322
20	11 11 31.82	2.0654	4 12 57.9	16.337
21	11 13 35.68	2.0632	3 56 37.3	16.350
22	11 15 39.41	2.0611	3 40 15.9	16.362
23	11 17 43.01	2.0590	3 23 53.9	16.371
24	11 19 46.49	2.0571	N. 3 7 31.4	16.379

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 21.					**WEDNESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 19 46.49	2.0571	N. 3 7 31.4	16.379	0	12 57 55.81	2.0647	S. 9 43 29.8	15.241
1	11 21 49.86	2.0552	2 51 8.4	16.387	1	12 59 59.75	2.0667	9 58 42.6	15.186
2	11 23 53.12	2.0534	2 34 44.9	16.394	2	13 2 3.81	2.0688	10 13 52.1	15.130
3	11 25 56.27	2.0517	2 18 21.1	16.399	3	13 4 8.01	2.0711	10 28 58.2	15.072
4	11 27 59.32	2.0502	2 1 57.0	16.402	4	13 6 12.35	2.0734	10 44 0.7	15.012
5	11 30 2.29	2.0488	1 45 32.8	16.404	5	13 8 16.82	2.0757	10 58 59.6	14.952
6	11 32 5.17	2.0473	1 29 8.5	16.405	6	13 10 21.43	2.0781	11 13 54.9	14.890
7	11 34 7.96	2.0459	1 12 44.2	16.404	7	13 12 26.19	2.0806	11 28 46.4	14.826
8	11 36 10.68	2.0447	0 56 20.0	16.402	8	13 14 31.10	2.0831	11 43 34.0	14.762
9	11 38 13.33	2.0436	0 39 56.0	16.398	9	13 16 36.16	2.0857	11 58 17.8	14.697
10	11 40 15.91	2.0425	0 23 32.2	16.394	10	13 18 41.38	2.0883	12 12 57.6	14.629
11	11 42 18.43	2.0415	N. 0 7 8.7	16.388	11	13 20 46.76	2.0911	12 27 33.3	14.561
12	11 44 20.89	2.0406	S. 0 9 14.4	16.381	12	13 22 52.31	2.0938	12 42 4.9	14.492
13	11 46 23.30	2.0398	0 25 37.0	16.372	13	13 24 58.02	2.0967	12 56 32.3	14.421
14	11 48 25.67	2.0392	0 41 59.0	16.362	14	13 27 3.91	2.0996	13 10 55.4	14.349
15	11 50 28.00	2.0386	0 58 20.4	16.350	15	13 29 9.97	2.1025	13 25 14.2	14.276
16	11 52 30.30	2.0381	1 14 41.0	16.338	16	13 31 16.21	2.1055	13 39 28.5	14.201
17	11 54 32.57	2.0376	1 31 0.9	16.324	17	13 33 22.63	2.1085	13 53 38.3	14.126
18	11 56 34.81	2.0373	1 47 19.9	16.308	18	13 35 29.23	2.1116	14 7 43.6	14.049
19	11 58 37.04	2.0370	2 3 37.9	16.292	19	13 37 36.02	2.1147	14 21 44.2	13.970
20	12 0 39.25	2.0368	2 19 54.9	16.273	20	13 39 43.00	2.1179	14 35 40.0	13.890
21	12 2 41.45	2.0367	2 36 10.7	16.253	21	13 41 50.17	2.1212	14 49 31.0	13.809
22	12 4 43.65	2.0367	2 52 25.3	16.233	22	13 43 57.54	2.1245	15 3 17.1	13.727
23	12 6 45.85	2.0367	S. 3 8 38.7	16.212	23	13 46 5.11	2.1278	S. 15 16 58.3	13.645
	TUESDAY 22.					**THURSDAY 24.**			
0	12 8 48.06	2.0369	S. 3 24 50.7	16.188	0	13 48 12.87	2.1311	S. 15 30 34.5	13.561
1	12 10 50.28	2.0372	3 41 1.3	16.164	1	13 50 20.84	2.1345	15 44 5.6	13.474
2	12 12 52.52	2.0375	3 57 10.4	16.138	2	13 52 29.01	2.1379	15 57 31.4	13.387
3	12 14 54.78	2.0379	4 13 17.8	16.110	3	13 54 37.39	2.1414	16 10 52.0	13.299
4	12 16 57.07	2.0384	4 29 23.6	16.082	4	13 56 45.98	2.1449	16 24 7.3	13.210
5	12 18 59.39	2.0389	4 45 27.7	16.052	5	13 58 54.78	2.1485	16 37 17.2	13.118
6	12 21 1.74	2.0396	5 1 29.9	16.021	6	14 1 3.80	2.1521	16 50 21.5	13.026
7	12 23 4.14	2.0403	5 17 30.2	15.989	7	14 3 13.03	2.1557	17 3 20.3	12.933
8	12 25 6.58	2.0411	5 33 28.6	15.956	8	14 5 22.48	2.1593	17 16 13.5	12.839
9	12 27 9.07	2.0420	5 49 24.9	15.921	9	14 7 32.15	2.1630	17 29 1.0	12.743
10	12 29 11.62	2.0430	6 5 19.1	15.885	10	14 9 42.04	2.1667	17 41 42.7	12.647
11	12 31 14.23	2.0441	6 21 11.1	15.847	11	14 11 52.15	2.1704	17 54 18.6	12.549
12	12 33 16.91	2.0452	6 37 0.7	15.808	12	14 14 2.49	2.1742	18 6 48.6	12.450
13	12 35 19.66	2.0464	6 52 48.0	15.768	13	14 16 13.05	2.1779	18 19 12.6	12.349
14	12 37 22.48	2.0477	7 8 32.9	15.727	14	14 18 23.84	2.1817	18 31 30.5	12.247
15	12 39 25.38	2.0491	7 24 15.2	15.683	15	14 20 34.86	2.1856	18 43 42.3	12.145
16	12 41 28.37	2.0506	7 39 54.9	15.639	16	14 22 46.11	2.1893	18 55 47.9	12.041
17	12 43 31.45	2.0520	7 55 31.9	15.594	17	14 24 57.58	2.1931	19 7 47.2	11.935
18	12 45 34.61	2.0535	8 11 6.2	15.548	18	14 27 9.28	2.1969	19 19 40.1	11.828
19	12 47 37.87	2.0552	8 26 37.7	15.501	19	14 29 21.21	2.2008	19 31 26.6	11.721
20	12 49 41.24	2.0570	8 42 6.3	15.451	20	14 31 33.38	2.2047	19 43 6.6	11.613
21	12 51 44.71	2.0588	8 57 31.8	15.400	21	14 33 45.78	2.2086	19 54 40.1	11.503
22	12 53 48.29	2.0607	9 12 51.3	15.349	22	14 35 58.41	2.2124	20 6 7.0	11.392
23	12 55 51.99	2.0627	9 28 13.7	15.296	23	14 38 11.27	2.2163	20 17 27.2	11.280
24	12 57 55.81	2.0647	S. 9 43 29.8	15.241	24	14 40 24.37	2.2202	S. 20 28 40.6	11.167

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 40 24.37	2.2202	S.20 28 40.6	11.167	0	16 30 56.09	2.3650	S.26 55 31.0	4.642
1	14 42 37.70	2.2241	20 39 47.2	11.053	1	16 33 18.03	2.3662	27 0 5.0	4.490
2	14 44 51.26	2.2279	20 50 46.9	10.938	2	16 35 40.04	2.3674	27 4 29.8	4.337
3	14 47 5.05	2.2318	21 1 39.7	10.821	3	16 38 2.12	2.3686	27 8 45.4	4.183
4	14 49 19.07	2.2357	21 12 25.4	10.703	4	16 40 24.27	2.3697	27 12 51.8	4.030
5	14 51 33.33	2.2396	21 23 4.0	10.584	5	16 42 46.48	2.3706	27 16 49.1	3.878
6	14 53 47.82	2.2434	21 33 35.5	10.465	6	16 45 8.73	2.3713	27 20 37.2	3.725
7	14 56 2.54	2.2472	21 43 59.8	10.343	7	16 47 31.03	2.3721	27 24 16.1	3.571
8	14 58 17.48	2.2509	21 54 16.7	10.221	8	16 49 53.38	2.3727	27 27 45.7	3.417
9	15 0 32.65	2.2547	22 4 26.3	10.098	9	16 52 15.76	2.3732	27 31 6.1	3.263
10	15 2 48.05	2.2585	22 14 28.5	9.975	10	16 54 38.16	2.3736	27 34 17.3	3.109
11	15 5 3.67	2.2622	22 24 23.3	9.850	11	16 57 0.59	2.3739	27 37 19.2	2.955
12	15 7 19.51	2.2658	22 34 10.5	9.723	12	16 59 23.03	2.3741	27 40 11.9	2.801
13	15 9 35.57	2.2696	22 43 50.1	9.597	13	17 1 45.48	2.3742	27 42 55.3	2.647
14	15 11 51.86	2.2733	22 53 22.1	9.469	14	17 4 7.93	2.3742	27 45 29.5	2.492
15	15 14 8.37	2.2769	23 2 46.4	9.340	15	17 6 30.38	2.3741	27 47 54.4	2.337
16	15 16 25.09	2.2805	23 12 2.9	9.209	16	17 8 52.82	2.3737	27 50 10.0	2.182
17	15 18 42.03	2.2841	23 21 11.5	9.078	17	17 11 15.23	2.3733	27 52 16.3	2.028
18	15 20 59.18	2.2876	23 30 12.2	8.947	18	17 13 37.62	2.3729	27 54 13.4	1.874
19	15 23 16.54	2.2911	23 39 5.1	8.815	19	17 15 59.98	2.3723	27 56 1.2	1.720
20	15 25 34.11	2.2945	23 47 50.0	8.681	20	17 18 22.30	2.3717	27 57 39.8	1.566
21	15 27 51.88	2.2979	23 56 26.8	8.546	21	17 20 44.58	2.3709	27 59 9.1	1.412
22	15 30 9.86	2.3012	24 4 55.5	8.411	22	17 23 6.81	2.3700	28 0 29.2	1.258
23	15 32 28.03	2.3045	S.24 13 16.1	8.275	23	17 25 28.98	2.3690	S.28 1 40.1	1.104
	SATURDAY 26.					MONDAY 28.			
0	15 34 46.40	2.3077	S.24 21 28.5	8.137	0	17 27 51.09	2.3679	S.28 2 41.7	0.950
1	15 37 4.96	2.3109	24 29 32.6	7.999	1	17 30 13.13	2.3667	28 3 34.1	0.797
2	15 39 23.71	2.3141	24 37 28.4	7.861	2	17 32 35.09	2.3653	28 4 17.3	0.644
3	15 41 42.65	2.3172	24 45 15.9	7.722	3	17 34 56.96	2.3638	28 4 51.4	0.491
4	15 44 1.77	2.3202	24 52 55.0	7.581	4	17 37 18.74	2.3623	28 5 16.3	0.338
5	15 46 21.07	2.3232	25 0 25.6	7.440	5	17 39 40.43	2.3607	28 5 32.0	0.186
6	15 48 40.55	2.3261	25 7 47.8	7.298	6	17 42 2.02	2.3589	28 5 38.6	−0.034
7	15 51 0.20	2.3288	25 15 1.4	7.156	7	17 44 23.50	2.3570	28 5 36.1	+0.117
8	15 53 20.01	2.3316	25 22 6.5	7.012	8	17 46 44.86	2.3550	28 5 24.5	0.268
9	15 55 39.99	2.3343	25 29 2.9	6.867	9	17 49 6.10	2.3529	28 5 3.9	0.419
10	15 58 0.13	2.3369	25 35 50.6	6.723	10	17 51 27.21	2.3507	28 4 34.2	0.570
11	16 0 20.42	2.3394	25 42 29.7	6.579	11	17 53 48.19	2.3485	28 3 55.5	0.719
12	16 2 40.86	2.3418	25 49 0.1	6.433	12	17 56 9.03	2.3461	28 3 7.9	0.868
13	16 5 1.44	2.3443	25 55 21.7	6.287	13	17 58 29.72	2.3436	28 2 11.3	1.018
14	16 7 22.17	2.3467	26 1 34.5	6.139	14	18 0 50.26	2.3410	28 1 5.7	1.167
15	16 9 43.04	2.3489	26 7 38.4	5.992	15	18 3 10.64	2.3383	27 59 51.2	1.315
16	16 12 4.04	2.3510	26 13 33.5	5.843	16	18 5 30.86	2.3356	27 58 27.9	1.462
17	16 14 25.16	2.3530	26 19 19.6	5.694	17	18 7 50.91	2.3327	27 56 55.8	1.609
18	16 16 46.40	2.3550	26 24 56.8	5.545	18	18 10 10.78	2.3297	27 55 14.8	1.756
19	16 19 7.76	2.3569	26 30 25.0	5.396	19	18 12 30.47	2.3267	27 53 25.0	1.902
20	16 21 29.23	2.3587	26 35 44.3	5.247	20	18 14 49.98	2.3235	27 51 26.6	2.046
21	16 23 50.80	2.3603	26 40 54.6	5.096	21	18 17 9.29	2.3202	27 49 19.5	2.190
22	16 26 12.47	2.3619	26 45 55.8	4.944	22	18 19 28.40	2.3168	27 47 3.8	2.334
23	16 28 34.23	2.3635	26 50 47.9	4.793	23	18 21 47.31	2.3135	27 44 39.4	2.478
24	16 30 56.09	2.3650	S.26 55 31.0	4.642	24	18 24 6.02	2.3100	S.27 42 6.4	2.621

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 24 6.02	2.3100	S.27 42 6.4	2.621
1	18 26 24.51	2.3064	27 39 24.9	2.762
2	18 28 42.78	2.3028	27 36 34.9	2.903
3	18 31 0.84	2.2991	27 33 36.5	3.043
4	18 33 18.67	2.2952	27 30 29.7	3.183
5	18 35 36.26	2.2913	27 27 14.5	3.322
6	18 37 53.62	2.2873	27 23 51.0	3.461
7	18 40 10.74	2.2832	27 20 19.2	3.598
8	18 42 27.61	2.2791	27 16 39.2	3.734
9	18 44 44.23	2.2749	27 12 51.1	3.870
10	18 47 0.60	2.2707	27 8 54.8	4.005
11	18 49 16.71	2.2663	27 4 50.5	4.139
12	18 51 32.56	2.2620	27 0 38.1	4.273
13	18 53 48.15	2.2576	26 56 17.7	4.406
14	18 56 3.47	2.2530	26 51 49.4	4.537
15	18 58 18.51	2.2484	26 47 13.3	4.668
16	19 0 33.28	2.2438	26 42 29.3	4.798
17	19 2 47.77	2.2392	26 37 37.5	4.927
18	19 5 1.98	2.2344	26 32 38.0	5.055
19	19 7 15.90	2.2297	26 27 30.9	5.182
20	19 9 29.54	2.2249	26 22 16.1	5.309
21	19 11 42.89	2.2201	26 16 53.8	5.434
22	19 13 55.95	2.2152	26 11 24.0	5.559
23	19 16 8.71	2.2102	S.26 5 46.7	5.682

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 18 21.17	2.2052	S.26 0 2.1	5.805
1	19 20 33.33	2.2003	25 54 10.1	5.927
2	19 22 45.19	2.1952	25 48 10.8	6.047
3	19 24 56.75	2.1901	25 42 4.4	6.167
4	19 27 8.00	2.1849	25 35 50.8	6.286
5	19 29 18.94	2.1798	25 29 30.1	6.404
6	19 31 29.58	2.1747	25 23 2.3	6.521
7	19 33 39.91	2.1695	25 16 27.6	6.637
8	19 35 49.92	2.1642	25 9 45.9	6.753
9	19 37 59.62	2.1590	25 2 57.3	6.867
10	19 40 9.00	2.1537	24 56 1.9	6.979
11	19 42 18.07	2.1485	24 48 59.8	7.091
12	19 44 26.82	2.1432	24 41 51.0	7.202
13	19 46 35.25	2.1379	24 34 35.5	7.313
14	19 48 43.37	2.1327	24 27 13.4	7.422
15	19 50 51.17	2.1273	24 19 44.9	7.529
16	19 52 58.65	2.1220	24 12 9.9	7.637
17	19 55 5.81	2.1167	24 4 28.5	7.743
18	19 57 12.65	2.1113	23 56 40.7	7.849
19	19 59 19.17	2.1060	23 48 46.6	7.953
20	20 1 25.37	2.1007	23 40 46.3	8.056
21	20 3 31.25	2.0953	23 32 39.9	8.158
22	20 5 36.81	2.0900	23 24 27.4	8.259
23	20 7 42.05	2.0847	23 16 8.8	8.359
24	20 9 46.98	2.0795	S.23 7 44.3	8.458

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 9 46.98	2.0795	S.23 7 44.3	8.458
1	20 11 51.59	2.0742	22 59 13.8	8.556
2	20 13 55.88	2.0688	22 50 37.5	8.653
3	20 15 59.85	2.0636	22 41 55.4	8.750
4	20 18 3.51	2.0583	22 33 7.5	8.846
5	20 20 6.85	2.0531	22 24 13.9	8.940
6	20 22 9.88	2.0478	22 15 14.7	9.033
7	20 24 12.59	2.0427	22 6 9.9	9.126
8	20 26 15.00	2.0376	21 56 59.6	9.218
9	20 28 17.10	2.0324	21 47 43.8	9.308
10	20 30 18.89	2.0273	21 38 22.6	9.397
11	20 32 20.37	2.0222	21 28 56.1	9.486
12	20 34 21.55	2.0171	21 19 24.3	9.573
13	20 36 22.42	2.0120	21 9 47.3	9.660
14	20 38 22.99	2.0070	21 0 5.1	9.747
15	20 40 23.26	2.0020	20 50 17.7	9.832
16	20 42 23.23	1.9971	20 40 25.3	9.915
17	20 44 22.91	1.9922	20 30 27.9	9.998
18	20 46 22.29	1.9873	20 20 25.5	10.081
19	20 48 21.38	1.9824	20 10 18.2	10.162
20	20 50 20.18	1.9775	20 0 6.1	10.242
21	20 52 18.68	1.9727	19 49 49.2	10.322
22	20 54 16.90	1.9680	19 39 27.5	10.401
23	20 56 14.84	1.9633	S.19 29 1.1	10.478

FRIDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 58 12.50	1.9587	S.19 18 30.2	10.554

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, . .	4	23	18.7
● New Moon, . .	12	17	29.4
☽ First Quarter, . .	19	12	56.5
○ Full Moon, . . .	26	16	5.1

	d	h
☾ Apogee, ...	4	20.0
☾ Perigee, ...	17	5.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	64° 59′ 49″	2867	66° 32′ 50″	2870	68° 5′ 36″	2891	69° 38′ 7″	2901
	Antares	W.	19 5 35	2867	20 38 36	2879	22 11 22	2890	23 43 54	2901
	Mars	E.	41 43 21	3084	40 14 52	3097	38 46 39	3110	37 18 41	3121
	Fomalhaut	E.	64 54 4	3221	63 28 20	3242	62 3 1	3265	60 38 9	3288
	Saturn	E.	80 9 23	2901	78 37 5	2912	77 5 2	2924	75 33 14	2936
	α Pegasi	E.	86 29 18	3089	85 0 55	3101	83 32 47	3114	82 4 55	3127
2	Spica	W.	77 17 14	2954	78 48 24	2963	80 19 23	2973	81 50 10	2982
	Antares	W.	31 23 5	2954	32 54 16	2962	34 25 16	2972	35 56 4	2981
	Mars	E.	30 2 18	3176	28 35 40	3187	27 9 15	3196	25 43 1	3206
	Fomalhaut	E.	53 40 46	3416	52 18 48	3445	50 57 22	3475	49 36 30	3506
	Saturn	E.	67 57 46	2989	66 27 19	2999	64 57 5	3008	63 27 2	3018
	α Pegasi	E.	74 49 30	3193	73 23 13	3206	71 57 11	3220	70 31 25	3234
	Sun	E.	122 30 43	3332	121 7 9	3342	119 43 46	3352	118 20 35	3361
3	Spica	W.	89 21 28	3019	90 51 17	3026	92 20 57	3032	93 50 30	3039
	Antares	W.	43 27 29	3019	44 57 18	3025	46 27 0	3031	47 56 34	3037
	Jupiter	W.	18 43 9	3157	20 10 10	3143	21 37 28	3132	23 4 59	3123
	Fomalhaut	E.	43 1 49	3701	41 45 3	3749	40 29 8	3801	39 14 7	3857
	Saturn	E.	55 59 27	3056	54 30 24	3064	53 1 30	3069	51 32 43	3075
	α Pegasi.	E.	63 26 39	3303	62 2 31	3317	60 38 39	3332	59 15 4	3346
	Sun	E.	111 27 6	3401	110 4 51	3408	108 42 43	3414	107 20 42	3420
4	Antares	W.	55 22 53	3058	56 51 54	3060	58 20 52	3063	59 49 47	3065
	Jupiter	W.	30 24 27	3103	31 52 33	3101	33 20 42	3099	34 48 53	3096
	Saturn	E.	44 10 25	3098	42 42 13	3102	41 14 6	3105	39 46 2	3108
	α Pegasi	E.	52 21 38	3430	50 59 55	3448	49 38 33	3468	48 17 33	3488
	Sun	E.	100 32 8	3442	99 10 39	3446	97 49 14	3447	96 27 51	3450
5	Antares	W.	67 14 1	3066	68 42 52	3065	70 11 44	3064	71 40 38	3061
	Jupiter	W.	42 10 31	3084	43 39 0	3081	45 7 33	3078	46 36 10	3074
	Saturn	E.	32 26 20	3114	30 58 28	3114	29 30 36	3114	28 2 44	3114
	Sun	E.	89 41 20	3452	88 20 2	3451	86 58 43	3449	85 37 22	3446
6	Antares	W.	79 5 58	3044	80 35 16	3039	82 4 40	3034	83 34 10	3028
	Jupiter	W.	54 0 31	3050	55 29 42	3044	56 59 0	3038	58 28 26	3032
	α Aquilæ	W.	39 51 48	5556	40 41 53	5395	41 33 51	5249	42 27 36	5116
	Sun	E.	78 49 48	3429	77 28 4	3423	76 6 14	3417	74 44 17	3412
7	Jupiter	W.	65 57 46	2993	67 28 8	2984	68 58 41	2974	70 29 26	2965
	α Aquilæ	W.	47 19 42	4592	48 22 14	4509	49 25 58	4431	50 30 51	4358
	Mars	W.	26 38 15	3215	28 4 6	3206	29 30 8	3197	30 56 21	3187
	Sun	E.	67 52 42	3374	66 29 56	3366	65 7 1	3357	63 43 55	3348
8	Jupiter	W.	78 6 19	2912	79 38 22	2901	81 10 40	2889	82 43 13	2877
	α Aquilæ	W.	56 10 37	4058	57 21 20	4008	58 32 52	3960	59 45 11	3916
	Mars	W.	38 10 31	3133	39 38 1	3121	41 5 45	3109	42 33 44	3096
	Sun	E.	56 45 36	3995	55 21 19	3984	53 56 49	3972	52 32 5	3961
9	Jupiter	W.	90 29 52	2815	92 4 1	2801	93 38 28	2788	95 13 12	2775
	α Aquilæ	W.	65 57 31	3721	67 13 56	3686	68 30 58	3654	69 48 34	3623
	Mars	W.	49 57 34	3030	51 27 9	3016	52 57 2	3002	54 27 12	2989
	Fomalhaut	W.	38 34 32	3616	39 52 49	3551	41 12 17	3492	42 32 50	3438

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	71° 10′ 24″	2912	72° 42′ 27″	2924	74° 14′ 16″	2935	75° 45′ 51″	2944
	Antares	W.	25 16 11	2912	26 48 14	2923	28 20 4	2933	29 51 41	2943
	Mars	E.	35 50 57	3133	34 23 27	3144	32 56 11	3155	31 29 8	3166
	Fomalhaut	E.	59 13 43	3312	57 49 45	3337	56 26 16	3362	55 3 16	3388
	Saturn	E.	74 1 41	2947	72 30 22	2958	70 59 17	2969	69 28 25	2979
	α Pegasi	E.	80 37 18	3140	79 9 57	3153	77 42 52	3167	76 16 3	3180
2	Spica	W.	83 20 45	2990	84 51 10	2998	86 21 25	3005	87 51 31	3013
	Antares	W.	37 26 41	2989	38 57 8	2997	40 27 24	3005	41 57 31	3012
	Mars	E.	24 16 59	3215	22 51 8	3223	21 25 26	3231	19 59 54	3239
	Fomalhaut	E.	48 16 15	3542	46 56 37	3577	45 37 38	3616	44 19 21	3658
	Saturn	E.	61 57 11	3026	60 27 30	3034	58 58 0	3042	57 28 39	3049
	α Pegasi	E.	69 5 56	3947	67 40 42	3961	66 15 45	3975	64 51 4	3988
	Sun	E.	116 57 34	3370	115 34 43	3379	114 12 2	3386	112 49 30	3393
3	Spica	W.	95 19 55	3043	96 49 14	3047	98 18 28	3052	99 47 37	3056
	Antares	W.	49 26 1	3042	50 55 22	3047	52 24 37	3051	53 53 47	3054
	Jupiter	W.	24 32 41	3117	26 0 30	3112	27 28 25	3109	28 56 24	3105
	Fomalhaut	E.	38 0 4	3919	36 47 4	3988	35 35 13	4064	34 24 36	4149
	Saturn	E.	50 4 3	3081	48 35 30	3086	47 7 3	3090	45 38 41	3095
	α Pegasi	E.	57 51 46	3362	56 28 46	3378	55 6 4	3394	53 43 41	3412
	Sun	E.	105 58 48	3425	104 37 0	3431	103 15 18	3435	101 53 41	3438
4	Antares	W.	61 18 40	3066	62 47 31	3067	64 16 21	3067	65 45 11	3067
	Jupiter	W.	36 17 7	3094	37 45 24	3092	39 13 43	3090	40 42 5	3087
	Saturn	E.	38 18 2	3110	36 50 4	3111	35 22 8	3112	33 54 13	3114
	α Pegasi	E.	46 56 56	3511	45 36 44	3535	44 16 59	3561	42 57 42	3589
	Sun	E.	95 6 31	3452	93 45 13	3452	92 23 55	3453	91 2 38	3452
5	Antares	W.	73 9 35	3059	74 38 35	3056	76 7 38	3052	77 36 46	3049
	Jupiter	W.	48 4 51	3070	49 33 37	3065	51 2 29	3060	52 31 27	3056
	Saturn	E.	26 34 52	3114	25 7 0	3114	23 39 8	3114	22 11 16	3115
	Sun	E.	84 15 58	3444	82 54 31	3441	81 33 1	3438	80 11 27	3433
6	Antares	W.	85 3 48	3022	86 33 33	3015	88 3 27	3008	89 33 30	3001
	Jupiter	W.	59 57 59	3025	61 27 41	3017	62 57 33	3009	64 27 34	3001
	α Aquilæ	W.	43 23 1	4904	44 20 1	4881	45 18 31	4777	46 18 26	4680
	Sun	E.	73 22 14	3405	72 0 3	3399	70 37 45	3391	69 15 18	3383
7	Jupiter	W.	72 0 23	2956	73 31 32	2945	75 2 54	2934	76 34 30	2924
	α Aquilæ	W.	51 36 50	4291	52 43 51	4228	53 51 51	4168	55 0 47	4112
	Mars	W.	32 22 46	3177	33 49 23	3167	35 16 12	3156	36 43 15	3144
	Sun	E.	62 20 39	3338	60 57 11	3328	59 83 32	3317	58 9 40	3306
8	Jupiter	W.	84 16 1	2865	85 49 5	2853	87 22 24	2840	88 56 0	2828
	α Aquilæ	W.	60 58 15	3878	62 12 3	3831	63 26 33	3792	64 41 43	3756
	Mars	W.	44 1 58	3083	45 30 28	3070	46 59 14	3057	48 28 16	3044
	Sun	E.	51 7 8	3249	49 41 57	3236	48 16 31	3226	46 50 51	3212
9	Jupiter	W.	96 48 13	2761	98 23 32	2747	99 59 9	2734	101 35 4	2719
	α Aquilæ	W.	71 6 43	3593	72 25 25	3565	73 44 37	3538	75 4 19	3512
	Mars	W.	55 57 39	2974	57 28 24	2959	58 59 28	2945	60 30 50	2930
	Fomalhaut	W.	43 54 23	3387	45 16 54	3341	46 40 18	3297	48 4 33	3255

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Saturn	W.	15° 54′ 29″	2905	17° 26′ 41″	2883	18° 59′ 22″	2862	20° 32′ 30″	2842
	Sun	E.	45 24 56	3199	43 58 46	3187	42 32 21	3174	41 5 41	3163
10	α Aquilæ	W.	76 24 30	3488	77 45 8	3464	79 6 12	3441	80 27 42	3420
	Mars	W.	62 2 31	2915	63 34 31	2901	65 6 49	2886	66 39 26	2871
	Fomalhaut	W.	49 29 37	3217	50 55 26	3180	52 21 59	3145	53 49 14	3113
	α Pegasi	W.	28 53 17	3817	30 8 2	3700	31 24 49	3597	32 43 27	3505
	Saturn	W.	28 24 5	2756	29 59 30	2741	31 35 16	2725	33 11 23	2710
	Sun	E.	33 48 42	3103	32 20 36	3092	30 52 17	3082	29 23 46	3073
14	Sun	W.	17 12 54	2808	18 47 12	2773	20 22 15	2745	21 57 55	2721
	Pollux	E.	41 5 19	2342	39 20 21	2336	37 35 14	2331	35 49 59	2326
	Regulus	E.	77 53 30	2328	76 8 11	2320	74 22 41	2313	72 37 1	2306
15	Sun	W.	30 2 45	2645	31 40 39	2635	33 18 46	2626	34 57 6	2618
	Pollux	E.	27 2 13	2311	25 16 30	2311	23 30 47	2313	21 45 6	2316
	Regulus	E.	63 46 22	2279	61 59 51	2274	60 13 14	2270	58 26 30	2266
16	Sun	W.	43 11 5	2590	44 50 14	2586	46 29 28	2583	48 8 46	2580
	Regulus	E.	49 31 40	2253	47 44 31	2251	45 57 20	2249	44 10 6	2249
	Spica	E.	103 33 17	2254	101 46 10	2253	99 59 1	2251	98 11 50	2250
17	Sun	W.	56 25 58	2574	58 5 28	2574	59 44 59	2574	61 24 29	2574
	Regulus	E.	35 13 43	2247	33 26 26	2249	31 39 11	2249	29 51 57	2251
	Spica	E.	89 15 38	2249	87 28 24	2250	85 41 11	2250	83 53 58	2251
18	Sun	W.	69 41 42	2582	71 21 2	2585	73 0 18	2587	74 39 31	2590
	Pollux	W.	16 15 0	2333	18 0 11	2323	19 45 37	2315	21 31 14	2311
	Spica	E.	74 58 29	2261	73 11 32	2264	71 24 39	2266	69 37 50	2269
19	Sun	W.	82 54 34	2606	84 33 21	2610	86 12 2	2615	87 50 37	2618
	Pollux	W.	30 20 19	2307	32 6 8	2309	33 51 55	2311	35 37 39	2313
	Spica	E.	60 44 51	2285	58 58 30	2289	57 12 15	2294	55 26 6	2298
20	Sun	W.	96 2 5	2642	97 40 3	2647	99 17 54	2652	100 55 38	2657
	Pollux	W.	44 25 19	2329	46 10 36	2333	47 55 47	2337	49 40 52	2342
	Spica	E.	46 36 54	2320	44 51 23	2325	43 6 0	2330	41 20 44	2335
	Antares	E.	92 29 49	2317	90 44 14	2322	88 58 46	2326	87 13 25	2331
21	Sun	W.	109 2 25	2687	110 39 22	2693	112 16 11	2699	113 53 52	2706
	Pollux	W.	58 24 40	2365	60 9 5	2371	61 53 22	2375	63 37 32	2381
	Regulus	W.	21 27 45	2357	23 12 21	2362	24 56 50	2368	26 41 11	2373
	Spica	E.	32 36 17	2362	30 51 48	2368	29 7 28	2375	27 23 17	2381
	Antares	E.	78 28 29	2357	76 43 52	2362	74 59 23	2368	73 15 2	2373
	Jupiter	E.	102 36 25	2345	100 51 31	2350	99 6 44	2355	97 22 5	2361
22	Sun	W.	121 54 2	2741	123 29 48	2749	125 5 23	2756	126 40 49	2764
	Pollux	W.	72 16 22	2410	73 59 43	2415	75 42 56	2422	77 26 0	2429
	Regulus	W.	35 20 52	2403	37 4 22	2409	38 47 44	2415	40 30 57	2422
	Antares	E.	64 35 21	2403	62 51 50	2409	61 8 28	2415	59 25 15	2422
	Jupiter	E.	88 40 50	2389	86 57 0	2396	85 13 19	2402	83 29 47	2408
23	Pollux	W.	85 58 59	2461	87 41 7	2469	89 23 4	2476	91 4 51	2483

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
9	Saturn	W.	22° 6′ 3″	2824	23° 40′ 0″	2806	25° 14′ 20″	2789	26° 49′ 2″	2773
	Sun	E.	39 38 47	3150	38 11 38	3137	36 44 13	3125	35 16 34	3114
10	α Aquilæ	W.	81 49 36	3400	83 11 53	3380	84 34 32	3363	85 57 31	3345
	Mars	W.	68 12 22	2856	69 45 37	2842	71 19 11	2827	72 53 4	2811
	Fomalhaut	W.	55 17 8	3082	56 45 40	3052	58 14 49	3023	59 44 33	2997
	α Pegasi	W.	34 3 46	3423	35 25 37	3349	36 48 52	3282	38 13 24	3223
	Saturn	W.	34 47 50	2694	36 24 38	2678	38 1 47	2663	39 39 16	2649
	Sun	E.	27 55 3	3065	26 26 11	3059	24 57 11	3054	23 28 5	3061
14	Sun	W.	23 34 7	2701	25 10 45	2684	26 47 46	2669	28 25 7	2657
	Pollux	E.	34 4 37	2321	32 19 8	2317	30 33 33	2314	28 47 54	2313
	Regulus	E.	70 51 10	2300	69 5 10	2294	67 19 2	2289	65 32 46	2283
15	Sun	W.	36 35 36	2611	38 14 16	2604	39 53 5	2599	41 32 2	2594
	Pollux	E.	19 59 30	2322	18 14 3	2331	16 28 49	2346	14 43 56	2367
	Regulus	E.	56 39 41	2263	54 52 47	2260	53 5 48	2258	51 18 46	2255
16	Sun	W.	49 48 8	2578	51 27 33	2577	53 7 0	2576	54 46 28	2574
	Regulus	E.	42 22 51	2248	40 35 35	2247	38 48 18	2247	37 1 0	2247
	Spica	E.	96 24 37	2249	94 37 23	2249	92 50 8	2249	91 2 53	2249
17	Sun	W.	63 3 59	2575	64 43 28	2577	66 22 55	2578	68 2 20	2580
	Regulus	E.	28 4 45	2252	26 17 35	2253	24 30 27	2256	22 43 22	2258
	Spica	E.	82 6 47	2253	80 19 38	2255	78 32 32	2257	76 45 29	2259
18	Sun	W.	76 18 40	2593	77 57 45	2596	79 36 46	2599	81 15 42	2602
	Pollux	W.	23 16 58	2308	25 2 46	2306	26 48 37	2306	28 34 28	2306
	Spica	E.	67 51 5	2272	66 4 24	2275	64 17 48	2279	62 31 17	2282
19	Sun	W.	89 29 7	2623	91 7 31	2627	92 45 49	2632	94 24 0	2637
	Pollux	W.	37 23 20	2315	39 8 57	2319	40 54 29	2322	42 39 57	2326
	Spica	E.	53 40 3	2302	51 54 6	2306	50 8 15	2311	48 22 31	2315
20	Sun	W.	102 33 15	2663	104 10 44	2669	105 48 6	2675	107 25 20	2681
	Pollux	W.	51 25 51	2346	53 10 43	2350	54 55 29	2355	56 40 8	2360
	Spica	E.	39 35 35	2340	37 50 34	2345	36 5 40	2350	34 20 54	2357
	Antares	E.	85 28 11	2336	83 43 4	2342	81 58 5	2346	80 13 13	2352
21	Sun	W.	115 29 24	2713	117 5 47	2719	118 42 1	2726	120 18 6	2733
	Pollux	W.	65 21 34	2387	67 5 28	2392	68 49 14	2398	70 32 52	2403
	Regulus	W.	28 25 24	2379	30 9 29	2385	31 53 25	2391	33 37 13	2397
	Spica	E.	25 39 15	2388	23 55 23	2395	22 11 41	2403	20 28 10	2411
	Antares	E.	71 30 49	2379	69 46 44	2385	68 2 48	2391	66 19 0	2397
	Jupiter	E.	95 37 34	2366	93 53 10	2372	92 8 55	2378	90 24 48	2384
22	Sun	W.	128 16 4	2772	129 51 9	2781	131 26 2	2789	133 0 44	2798
	Pollux	W.	79 8 54	2435	80 51 39	2441	82 34 15	2448	84 16 42	2455
	Regulus	W.	42 14 1	2429	43 56 55	2435	45 39 40	2441	47 22 16	2448
	Antares	E.	57 42 12	2429	55 59 18	2435	54 16 33	2442	52 33 58	2448
	Jupiter	E.	81 46 24	2415	80 3 10	2422	78 20 6	2428	76 37 11	2435
23	Pollux	W.	92 46 28	2490	94 27 55	2498	96 9 11	2506	97 50 16	2514

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Regulus	W.	49° 4′ 42″	2455	50° 46′ 59″	2462	52° 29′ 5″	2470	54° 11′ 1″	2477
	Antares	E.	50 51 32	2455	49 9 16	2462	47 27 10	2470	45 45 14	2477
	Jupiter	E.	74 54 26	2442	73 11 51	2449	71 29 26	2457	69 47 12	2464
24	Regulus	W.	62 38 5	2515	64 18 57	2523	65 59 38	2531	67 40 8	2540
	Antares	E.	37 18 12	2515	35 37 20	2524	33 56 40	2532	32 16 11	2540
	Jupiter	E.	61 18 44	2504	59 37 37	2513	57 56 42	2522	56 15 59	2531
25	Regulus	W.	75 59 41	2583	77 39 0	2592	79 18 6	2601	80 56 59	2610
	Spica	W.	22 0 41	2593	23 39 45	2601	25 18 39	2610	26 57 21	2618
	Jupiter	E.	47 55 40	2580	46 16 17	2591	44 37 9	2601	42 58 15	2612
	α Aquilæ	E.	80 10 54	3338	78 47 26	3355	77 24 18	3374	76 1 32	3395
	Mars	E.	98 48 58	2771	97 13 52	2781	95 38 59	2790	94 4 18	2800
26	Regulus	W.	89 8 14	2658	90 45 50	2669	92 23 12	2678	94 0 21	2689
	Spica	W.	35 7 55	2663	36 45 24	2672	38 22 41	2682	39 59 45	2692
	Jupiter	E.	34 47 48	2675	33 10 35	2689	31 33 41	2704	29 57 7	2721
	α Aquilæ	E.	69 14 3	3519	67 54 0	3550	66 34 31	3581	65 15 36	3615
	Mars	E.	86 14 5	2850	84 40 42	2860	83 7 32	2870	81 34 35	2880
27	Spica	W.	48 1 44	2742	49 37 28	2753	51 12 58	2763	52 48 14	2773
	α Aquilæ	E	58 50 56	3820	57 36 15	3869	56 22 24	3922	55 9 27	3979
	Mars	E.	73 53 12	2934	72 21 36	2945	70 50 14	2955	69 19 5	2966
	Fomalhaut	E.	80 43 0	3039	79 13 36	3052	77 44 28	3067	76 15 38	3082
	Saturn	E.	98 59 20	2765	97 24 6	2775	95 49 5	2785	94 14 18	2795
28	Spica	W.	60 41 13	2825	62 15 9	2835	63 48 51	2845	65 22 20	2856
	α Aquilæ	E.	49 20 0	4330	48 13 35	4417	47 8 29	4511	46 4 47	4612
	Mars	E.	61 46 46	3021	60 16 59	3031	58 47 25	3042	57 18 4	3052
	Fomalhaut	E.	68 56 8	3163	67 29 15	3181	66 2 43	3200	64 36 34	3220
	Saturn	E.	86 23 44	2848	84 50 18	2858	83 17 5	2868	81 44 5	2878
	α Pegasi	E.	90 32 47	3040	89 3 24	3050	87 34 13	3060	86 5 15	3072
29	Spica	W.	73 6 36	2904	74 38 50	2913	76 10 52	2922	77 42 42	2931
	Antares	W.	27 12 22	2903	28 44 37	2912	30 16 41	2921	31 48 33	2931
	Mars	E.	49 54 33	3104	48 26 28	3114	46 58 36	3124	45 30 56	3133
	Fomalhaut	E.	57 31 53	3330	56 8 16	3355	54 45 8	3381	53 22 30	3409
	Saturn	E.	74 2 18	2927	72 30 34	2937	70 59 2	2946	69 27 42	2956
	α Pegasi	E.	78 43 51	3129	77 16 17	3141	75 48 57	3153	74 21 52	3167
30	Spica	W.	85 19 6	2974	86 49 51	2981	88 20 27	2989	89 50 53	2997
	Antares	W.	39 25 5	2973	40 55 52	2981	42 26 29	2988	43 56 57	2995
	Mars	E.	38 15 23	3179	36 48 49	3188	35 22 25	3196	33 56 11	3205
	Fomalhaut	E.	46 37 51	3576	45 18 50	3616	44 0 33	3660	42 43 3	3707
	Saturn	E.	61 53 51	2999	60 23 37	3006	58 53 32	3014	57 23 37	3022
	α Pegasi	E.	67 10 19	3232	65 44 48	3246	64 19 33	3260	62 54 35	3275
31	Antares	W.	51 27 9	3027	52 56 48	3032	54 26 21	3038	55 55 47	3043
	Jupiter	W.	28 39 32	3052	30 8 40	3052	31 37 48	3052	33 6 56	3052
	Mars	E.	26 47 26	3243	25 22 8	3250	23 56 58	3258	22 31 57	3265
	Fomalhaut	E.	36 29 23	4014	35 17 57	4096	34 7 51	4186	32 59 12	4289
	Saturn	E.	49 56 19	3056	48 27 16	3062	46 58 20	3068	45 29 31	3073
	α Pegasi	E.	55 54 12	3355	54 31 4	3373	53 8 17	3392	51 45 51	3411

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Regulus	W.	55° 52′ 47″	2484	57° 34′ 23″	2492	59° 15′ 48″	2499	60° 57′ 2″	2507
	Antares	E.	44 3 28	2485	42 21 53	2492	40 40 28	2500	38 59 15	2507
	Jupiter	E.	68 5 8	2472	66 23 15	2480	64 41 33	2488	63 0 3	2496
24	Regulus	W.	69 20 26	2548	71 0 32	2556	72 40 27	2565	74 20 10	2574
	Antares	E.	30 35 53	2548	28 55 47	2557	27 15 53	2566	25 36 11	2574
	Jupiter	E.	54 35 29	2540	52 55 12	2550	51 15 8	2559	49 35 17	2569
25	Regulus	W.	82 35 40	2620	84 14 8	2629	85 52 23	2639	87 30 25	2649
	Spica	W.	28 35 52	2626	30 14 11	2635	31 52 18	2644	33 30 13	2654
	Jupiter	E.	41 19 37	2624	39 41 15	2636	38 3 9	2649	36 25 20	2661
	α Aquilæ	E.	74 39 10	3417	73 17 13	3439	71 55 41	3464	70 34 37	3491
	Mars	E.	92 29 50	2810	90 55 35	2819	89 21 32	2829	87 47 42	2839
26	Regulus	W.	95 37 16	2698	97 13 58	2709	98 50 26	2719	100 26 41	2729
	Spica	W.	41 36 35	2702	43 13 12	2712	44 49 36	2722	46 25 47	2732
	Jupiter	E.	28 20 55	2738	26 45 5	2757	25 9 41	2778	23 34 44	2801
	α Aquilæ	E.	63 57 18	3651	62 39 39	3689	61 22 40	3730	60 6 25	3774
	Mars	E.	80 1 51	2891	78 29 21	2901	76 57 4	2912	75 25 1	2924
27	Spica	W.	54 23 17	2784	55 58 6	2794	57 32 42	2805	59 7 4	2815
	α Aquilæ	E.	53 57 27	4040	52 46 27	4105	51 36 30	4175	50 27 40	4249
	Mars	E.	67 48 10	2977	66 17 29	2988	64 47 1	2999	63 16 47	3009
	Fomalhaut	E.	74 47 6	3097	73 18 53	3112	71 50 58	3129	70 23 23	3145
	Saturn	E.	92 39 44	2806	91 5 24	2816	89 31 17	2827	87 57 24	2837
28	Spica	W.	66 55 37	2865	68 28 41	2875	70 1 32	2885	71 34 10	2894
	α Aquilæ	E.	45 2 33	4723	44 1 53	4844	43 2 53	4975	42 5 38	5119
	Mars	E.	55 48 56	3063	54 20 1	3073	52 51 19	3084	51 22 50	3094
	Fomalhaut	E.	63 10 48	3240	61 45 26	3261	60 20 29	3283	58 55 58	3306
	Saturn	E.	80 11 18	2888	78 38 44	2898	77 6 23	2908	75 34 14	2918
	α Pegasi	E.	84 36 31	3082	83 8 0	3094	81 39 43	3105	80 11 40	3117
29	Spica	W.	79 14 21	2940	80 45 49	2949	82 17 6	2958	83 48 11	2966
	Antares	W.	33 20 13	2939	34 51 42	2948	36 23 0	2956	37 54 8	2965
	Mars	E.	44 3 27	3143	42 36 9	3153	41 9 3	3162	39 42 8	3170
	Fomalhaut	E.	52 0 24	3439	50 38 52	3470	49 17 54	3503	47 57 33	3538
	Saturn	E.	67 56 34	2965	66 25 37	2973	64 54 51	2982	63 24 16	2990
	α Pegasi	E.	72 55 3	3179	71 28 29	3192	70 2 10	3205	68 36 7	3218
30	Spica	W.	91 21 10	3004	92 51 18	3010	94 21 18	3017	95 51 10	3022
	Antares	W.	45 27 16	3002	46 57 26	3009	48 27 28	3015	49 57 22	3021
	Mars	E.	32 30 8	3213	31 4 14	3220	29 38 29	3228	28 12 53	3236
	Fomalhaut	E.	41 26 23	3758	40 10 37	3813	38 55 48	3874	37 42 2	3940
	Saturn	E.	55 53 52	3030	54 24 16	3037	52 54 49	3043	51 25 30	3050
	α Pegasi	E.	61 29 54	3290	60 5 31	3306	58 41 26	3321	57 17 39	3338
31	Antares	W.	57 25 8	3047	58 54 23	3051	60 23 33	3055	61 52 38	3057
	Jupiter	W.	34 36 4	3053	36 5 11	3053	37 34 18	3054	39 3 24	3056
	Mars	E.	21 7 4	3272	19 42 20	3280	18 17 45	3288	16 53 20	3297
	Fomalhaut	E.	31 52 9	4404	30 46 51	4534	29 43 29	4682	28 42 14	4850
	Saturn	E.	44 0 48	3078	42 32 12	3083	41 3 42	3087	39 35 17	3091
	α Pegasi	E.	50 23 47	3431	49 2 6	3454	47 40 50	3476	46 19 59	3501

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from / added to Apparent Time.	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	4 37 51.19	10.233	N.22 6 52.0	+20.05	15 48.26	68.43	2 25.99	0.376
Sat.	2	4 41 57.01	10.250	22 14 41.9	19.08	15 48.12	68.48	2 16.76	0.393
Sun.	3	4 46 3.23	10.266	22 22 8.5	18.11	15 47.99	68.53	2 7.12	0.409
Mon.	4	4 50 9.83	10.281	22 29 11.7	17.13	15 47.86	68.58	1 57.10	0.424
Tues.	5	4 54 16.79	10.296	22 35 51.5	16.14	15 47.74	68.63	1 46.73	0.439
Wed.	6	4 58 24.09	10.310	22 42 7.6	15.15	15 47.62	68.68	1 36.01	0.453
Thur.	7	5 2 31.72	10.324	22 47 59.8	14.16	15 47.51	68.72	1 24.96	0.467
Frid.	8	5 6 39.67	10.336	22 53 27.9	13.16	15 47.40	68.76	1 13.61	0.479
Sat.	9	5 10 47.88	10.347	22 58 31.9	12.16	15 47.29	68.80	1 1.99	0.490
Sun.	10	5 14 56.34	10.357	23 3 11.8	11.15	15 47.19	68.83	0 50.11	0.500
Mon.	11	5 19 5.02	10.366	23 7 27.2	10.13	15 47.09	68.86	0 38.01	0.509
Tues.	12	5 23 13.92	10.373	23 11 18.1	9.11	15 47.00	68.89	0 25.72	0.516
Wed.	13	5 27 22.98	10.380	23 14 44.5	8.08	15 46.91	68.91	0 13.25	0.523
Thur.	14	5 31 32.19	10.386	23 17 46.2	7.06	15 46.83	68.93	0 0.63	0.529
Frid.	15	5 35 41.54	10.391	23 20 23.2	6.03	15 46.76	68.94	0 12.12	0.534
Sat.	16	5 39 50.98	10.394	23 22 35.6	5.00	15 46.69	68.95	0 24.96	0.537
Sun.	17	5 44 0.48	10.396	23 24 23.3	3.97	15 46.62	68.96	0 37.88	0.539
Mon.	18	5 48 10.03	10.397	23 25 46.1	2.94	15 46.56	68.97	0 50.44	0.540
Tues.	19	5 52 19.59	10.397	23 26 44.1	1.90	15 46.51	68.97	1 3.81	0.540
Wed.	20	5 56 29.15	10.397	23 27 17.4	+ 0.87	15 46.46	68.97	1 16.77	0.540
Thur.	21	6 0 38.70	10.396	23 27 25.9	− 0.16	15 46.41	68.97	1 29.72	0.539
Frid.	22	6 4 48.21	10.393	23 27 9.6	1.19	15 46.37	68.97	1 42.64	0.536
Sat.	23	6 8 57.64	10.390	23 26 28.5	2.22	15 46.33	68.96	1 55.47	0.533
Sun.	24	6 13 6.98	10.386	23 25 22.7	3.25	15 46.29	68.95	2 8.21	0.529
Mon.	25	6 17 16.21	10.382	23 23 52.3	4.28	15 46.26	68.94	2 20.84	0.525
Tues.	26	6 21 25.31	10.376	23 21 57.1	5.31	15 46.23	68.92	2 33.36	0.519
Wed.	27	6 25 34.27	10.370	23 19 37.3	6.33	15 46.20	68.90	2 45.72	0.513
Thur.	28	6 29 43.07	10.362	23 16 53.1	7.35	15 46.18	68.87	2 57.92	0.505
Frid.	29	6 33 51.69	10.354	23 13 44.4	8.37	15 46.16	68.84	3 9.96	0.497
Sat.	30	6 38 0.10	10.345	23 10 11.3	9.39	15 46.14	68.81	3 21.78	0.488
Sun.	31	6 42 8.29	10.335	N.23 6 13.8	−10.40	15 46.13	68.77	3 33.38	0.478

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0s.19 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	Equation of Time, *to be added to* / *subtracted from* *Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	4 37 51.61	10.232	N.22 6 52.9	+20.05	2 25.97	0.376	4 40 17.58
Sat.	2	4 41 57.40	10.249	22 14 42.6	19.08	2 16.74	0.393	4 44 14.14
Sun.	3	4 46 3.60	10.265	22 22 9.1	18.11	2 7.09	0.409	4 48 10.69
Mon.	4	4 50 10.17	10.280	22 29 12.3	17.13	1 57.08	0.424	4 52 7.25
Tues.	5	4 54 17.10	10.295	22 35 52.0	16.14	1 46.71	0.439	4 56 3.81
Wed.	6	4 58 24.38	10.309	22 42 8.0	15.15	1 35.99	0.453	5 0 0.37
Thur.	7	5 2 31.98	10.323	22 48 0.2	14.16	1 24.95	0.467	5 3 56.93
Frid.	8	5 6 39.89	10.335	22 53 28.2	13.16	1 13.60	0.479	5 7 53.49
Sat.	9	5 10 48.07	10.346	22 58 32.1	12.16	1 1.98	0.490	5 11 50.05
Sun.	10	5 14 56.50	10.356	23 3 11.9	11.15	0 50.11	0.500	5 15 46.61
Mon.	11	5 19 5.15	10.365	23 7 27.2	10.13	0 38.01	0.509	5 19 43.16
Tues.	12	5 23 14.01	10.372	23 11 18.1	9.11	0 25.71	0.516	5 23 39.72
Wed.	13	5 27 23.03	10.379	23 14 44.5	8.08	0 13.25	0.523	5 27 36.28
Thur.	14	5 31 32.21	10.385	23 17 46.2	7.06	0 0.63	0.529	5 31 32.84
Frid.	15	5 35 41.52	10.390	23 20 23.2	6.03	0 12.12	0.534	5 35 29.40
Sat.	16	5 39 50.92	10.393	23 22 35.6	5.00	0 24.96	0.537	5 39 25.96
Sun.	17	5 44 0.39	10.395	23 24 23.3	3.97	0 37.87	0.539	5 43 22.52
Mon.	18	5 48 9.91	10.396	23 25 46.1	2.94	0 50.83	0.540	5 47 19.08
Tues.	19	5 52 19.44	10.396	23 26 44.1	1.90	1 3.80	0.540	5 51 15.64
Wed.	20	5 56 28.95	10.396	23 27 17.4	+ 0.87	1 16.76	0.540	5 55 12.20
Thur.	21	6 0 38.46	10.395	23 27 25.9	– 0.16	1 29.71	0.539	5 59 8.75
Frid.	22	6 4 47.93	10.392	23 27 9.5	1.19	1 42.62	0.536	6 3 5.31
Sat.	23	6 8 57.32	10.389	23 26 28.5	2.22	1 55.45	0.533	6 7 1.87
Sun.	24	6 13 6.62	10.385	23 25 22.8	3.25	2 8.19	0.529	6 10 58.43
Mon.	25	6 17 15.81	10.381	23 23 52.4	4.28	2 20.82	0.525	6 14 54.99
Tues.	26	6 21 24.89	10.375	23 21 57.3	5.31	2 33.34	0.519	6 18 51.55
Wed.	27	6 25 33.81	10.369	23 19 37.6	6.33	2 45.70	0.513	6 22 48.11
Thur.	28	6 29 42.57	10.361	23 16 53.5	7.35	2 57.90	0.505	6 26 44.67
Frid.	29	6 33 51.15	10.353	23 13 44.9	8.37	3 9.93	0.497	6 30 41.22
Sat.	30	6 37 59.53	10.344	23 10 11.8	9.39	3 21.75	0.488	6 34 37.78
Sun.	31	6 42 7.69	10.334	N.23 6 14.4	–10.40	3 33.35	0.478	6 38 34.34

Note.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

– prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour.
$+9^{s}.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	THE SUN'S *True* LONGITUDE. λ′	THE SUN'S Diff. for 1 hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	152	71 2 30.1	2 3.0	143.60	+0.04	0.0062466	+26.6	19 16 32.43
2	153	71 59 56.3	59 29.0	143.57	0.17	.0063096	25.9	19 12 36.52
3	154	72 57 21.8	56 54.3	143.55	0.30	.0063709	25.2	19 8 40.61
4	155	73 54 46.7	54 19.0	143.52	0.43	.0064304	24.4	19 4 44.69
5	156	74 52 10.9	51 43.1	143.50	0.56	.0064880	23.6	19 0 48.78
6	157	75 49 34.6	49 6.6	143.47	0.66	.0065436	22.7	18 56 52.87
7	158	76 46 57.6	46 29.4	143.45	0.76	.0065971	21.8	18 52 56.96
8	159	77 44 20.0	43 51.6	143.42	0.83	.0066482	20.8	18 49 1.04
9	160	78 41 41.9	41 13.3	143.40	0.85	.0066969	19.8	18 45 5.13
10	161	79 39 3.3	38 34.5	143.37	0.85	.0067431	18.8	18 41 9.22
11	162	80 36 24.0	35 55.0	143.35	0.82	.0067869	17.8	18 37 13.31
12	163	81 33 43.9	33 14.7	143.32	0.76	.0068282	16.8	18 33 17.39
13	164	82 31 3.1	30 33.7	143.28	0.67	.0068668	15.7	18 29 21.48
14	165	83 28 21.5	27 52.0	143.25	0.57	.0069029	14.7	18 25 25.57
15	166	84 25 39.2	25 9.5	143.22	0.45	.0069366	13.6	18 21 29.65
16	167	85 22 56.2	22 26.3	143.19	0.32	.0069681	12.6	18 17 33.73
17	168	86 20 12.3	19 42.2	143.15	0.19	.0069972	11.6	18 13 37.81
18	169	87 17 27.6	16 57.3	143.12	+0.06	.0070241	10.7	18 9 41.91
19	170	88 14 42.2	14 11.7	143.10	−0.07	.0070490	9.9	18 5 46.01
20	171	89 11 56.2	11 25.5	143.07	0.17	.0070720	9.2	18 1 50.09
21	172	90 9 9.6	8 38.7	143.05	0.26	.0070931	8.5	17 57 54.18
22	173	91 6 22.4	5 51.3	143.02	0.31	.0071126	7.8	17 53 58.27
23	174	92 3 34.6	3 3.4	143.00	0.33	.0071307	7.2	17 50 2.36
24	175	93 0 46.4	0 15.0	142.98	0.32	.0071473	6.5	17 46 6.43
25	176	93 57 57.8	57 26.2	142.97	0.28	.0071623	5.9	17 42 10.52
26	177	94 55 8.9	54 37.1	142.96	0.22	.0071759	5.3	17 38 14.61
27	178	95 52 19.9	51 47.9	142.96	0.13	.0071880	4.7	17 34 18.69
28	179	96 49 30.8	48 58.6	142.95	−0.03	.0071988	4.1	17 30 22.78
29	180	97 46 41.6	46 9.2	142.95	+0.09	.0072081	3.5	17 26 26.97
30	181	98 43 52.6	43 20.0	142.96	0.21	.0072157	2.8	17 22 30.96
31	182	99 41 3.8	40 31.0	142.97	+0.33	0.0072216	+ 2.1	17 18 35.05

Note: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9s.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.6	14 48.2	54 14.4	−0.23	54 12.8	−0.04	16 47.4	1.77	19.3
2	14 48.4	14 49.3	54 13.5	+0.17	54 16.8	+0.38	17 28.9	1.69	20.3
3	14 50.8	14 53.1	54 22.5	0.58	54 30.8	0.79	18 9.1	1.66	21.3
4	14 56.0	14 59.6	54 41.5	1.00	54 54.8	1.21	18 49.0	1.67	22.3
5	15 3.9	15 8.7	55 10.4	1.40	55 28.3	1.57	19 29.9	1.74	23.3
6	15 14.1	15 20.0	55 48.1	1.73	56 9.7	1.86	20 13.1	1.87	24.3
7	15 26.2	15 32.8	56 32.7	1.97	56 56.8	2.04	21 0.0	2.05	25.3
8	15 39.5	15 46.3	57 21.5	2.07	57 46.4	2.07	21 51.6	2.28	26.3
9	15 53.0	15 59.4	58 11.0	2.02	58 34.7	1.92	22 48.9	2.50	27.3
10	16 5.5	16 11.0	58 57.0	1.78	59 17.3	1.60	23 51.0	2.66	28.3
11	16 16.0	16 20.0	59 35.2	1.38	59 50.2	1.12	δ		29.3
12	16 23.3	16 25.6	60 2.1	0.85	60 10.6	+0.57	0 55.6	2.70	0.9
13	16 27.0	16 27.4	60 15.7	+0.28	60 17.3	−0.01	1 59.4	2.60	1.9
14	16 27.0	16 25.6	60 15.6	−0.28	60 10.7	0.53	2 59.8	2.42	2.9
15	16 23.5	16 20.7	60 3.0	0.75	59 52.8	0.95	3 55.6	2.22	3.9
16	16 17.4	16 13.5	59 40.4	1.11	59 26.4	1.23	4 47.0	2.07	4.9
17	16 9.4	16 5.0	59 11.1	1.32	58 54.9	1.38	5 35 4	1.97	5.9
18	16 0.4	15 55.6	58 38.0	1.42	58 20.8	1.44	6 22.1	1.93	6.9
19	15 50.9	15 46.2	58 3.4	1.45	57 46.1	1.43	7 8.6	1.95	7.9
20	15 41.5	15 37.0	57 29.0	1.42	57 12.1	1.39	7 56.1	2.02	8.9
21	15 32.5	15 28.1	56 55.6	1.36	56 39.5	1.32	8 45.5	2.11	9.9
22	15 23.9	15 19.7	56 23.9	1 28	56 8.8	1.23	9 37.2	2.20	10.9
23	15 15.8	15 12.0	55 54.3	1.19	55 40.3	1.14	10 30.8	2.26	11.9
24	15 8.4	15 4.9	55 27.0	1.08	55 14.3	1.03	11 25.3	2.26	12.9
25	15 1.6	14 58.6	55 2.3	0.97	54 51.1	0.89	12 18.9	2.19	13.9
26	14 55.8	14 53.3	54 40.9	0.81	54 31.7	0.72	13 10.2	2.07	14.9
27	14 51.1	14 49.3	54 23.6	0.62	54 16.8	0.51	13 58.4	1.94	15.9
28	14 47.8	14 46.8	54 11.5	0.38	54 7.8	−0.24	14 43.3	1.81	16.9
29	14 46.3	14 46.3	54 5.8	−0.09	54 5.7	+0.08	15 25.6	1.71	17.9
30	14 46.8	14 47.9	54 7.7	+0.25	54 11.8	0.44	16 5.9	1.65	18.9
31	14 49.6	14 52.0	54 18.2	+0.63	54 27.0	+0.83	16 45.3	1.64	19.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 1.

Hour.	Right Ascension. h	m	s	Diff. for 1 m. s	Declination.	°	′	″	Diff. for 1 m. ″
0	20	58	12.50	1.9587	S.	19	18	30.2	10.554
1	21	0	9.88	1.9540		19	7	54.7	10.630
2	21	2	6.98	1.9494		18	57	14.6	10.706
3	21	4	3.81	1.9449		18	46	30.0	10.780
4	21	6	0.37	1.9404		18	35	41.0	10.853
5	21	7	56.66	1.9360		18	24	47.7	10.925
6	21	9	52.69	1.9316		18	13	50.0	10.997
7	21	11	48.45	1.9272		18	2	48.1	11.067
8	21	13	43.95	1.9229		17	51	42.0	11.137
9	21	15	39.20	1.9187		17	40	31.7	11.206
10	21	17	34.19	1.9144		17	29	17.3	11.274
11	21	19	28.93	1.9103		17	17	58.8	11.342
12	21	21	23.43	1.9062		17	6	36.3	11.408
13	21	23	17.68	1.9022		16	55	9.8	11.473
14	21	25	11.69	1.8982		16	43	39.5	11.538
15	21	27	5.46	1.8943		16	32	5.3	11.602
16	21	28	59.00	1.8904		16	20	27.3	11.665
17	21	30	52.31	1.8866		16	8	45.5	11.728
18	21	32	45.39	1.8828		15	56	59.9	11.790
19	21	34	38.24	1.8791		15	45	10.7	11.850
20	21	36	30.88	1.8755		15	33	17.9	11.910
21	21	38	23.30	1.8718		15	21	21.5	11.969
22	21	40	15.50	1.8683		15	9	21.6	12.027
23	21	42	7.50	1.8649	S.	14	57	18.2	12.085

SATURDAY 2.

Hour.	Right Ascension. h	m	s	Diff. for 1 m. s	Declination.	°	′	″	Diff. for 1 m. ″
0	21	43	59.29	1.8615	S.	14	45	11.4	12.142
1	21	45	50.88	1.8582		14	33	1.2	12.198
2	21	47	42.27	1.8548		14	20	47.6	12.254
3	21	49	33.46	1.8516		14	8	30.7	12.308
4	21	51	24.46	1.8484		13	56	10.6	12.362
5	21	53	15.27	1.8453		13	43	47.2	12.416
6	21	55	5.90	1.8423		13	31	20.7	12.468
7	21	56	56.35	1.8393		13	18	51.1	12.519
8	21	58	46.62	1.8364		13	6	18.4	12.571
9	22	0	36.72	1.8336		12	53	42.6	12.622
10	22	2	26.65	1.8308		12	41	3.8	12.671
11	22	4	16.42	1.8282		12	28	22.1	12.719
12	22	6	6.03	1.8255		12	15	37.5	12.767
13	22	7	55.48	1.8229		12	2	50.0	12.815
14	22	9	44.78	1.8204		11	49	59.7	12.862
15	22	11	33.93	1.8180		11	37	6.6	12.908
16	22	13	22.94	1.8157		11	24	10.7	12.953
17	22	15	11.81	1.8133		11	11	12.2	12.998
18	22	17	0.54	1.8111		10	58	11.0	13.042
19	22	18	49.14	1.8089		10	45	7.2	13.085
20	22	20	37.61	1.8068		10	32	0.8	13.128
21	22	22	25.96	1.8048		10	18	51.8	13.171
22	22	24	14.19	1.8029		10	5	40.3	13.212
23	22	26	2.31	1.8010		9	52	26.4	13.251
24	22	27	50.31	1.7991	S.	9	39	10.2	13.290

SUNDAY 3.

Hour.	Right Ascension. h	m	s	Diff. for 1 m. s	Declination.	°	′	″	Diff. for 1 m. ″
0	22	27	50.31	1.7991	S.	9	39	10.2	13.290
1	22	29	38.20	1.7974		9	25	51.6	13.330
2	22	31	26.00	1.7958		9	12	30.6	13.369
3	22	33	13.70	1.7942		8	59	7.3	13.407
4	22	35	1.31	1.7927		8	45	41.8	13.443
5	22	36	48.83	1.7912		8	32	14.1	13.480
6	22	38	36.26	1.7898		8	18	44.2	13.516
7	22	40	23.61	1.7886		8	5	12.2	13.551
8	22	42	10.89	1.7874		7	51	38.1	13.586
9	22	43	58.10	1.7863		7	38	1.9	13.620
10	22	45	45.24	1.7852		7	24	23.7	13.653
11	22	47	32.32	1.7842		7	10	43.5	13.686
12	22	49	19.34	1.7832		6	57	1.4	13.717
13	22	51	6.30	1.7824		6	43	17.4	13.748
14	22	52	53.22	1.7817		6	29	31.6	13.779
15	22	54	40.10	1.7810		6	15	43.9	13.809
16	22	56	26.94	1.7803		6	1	54.5	13.838
17	22	58	13.74	1.7797		5	48	3.3	13.867
18	23	0	0.51	1.7792		5	34	10.4	13.895
19	23	1	47.25	1.7789		5	20	15.9	13.922
20	23	3	33.98	1.7787		5	6	19.8	13.949
21	23	5	20.69	1.7784		4	52	22.0	13.976
22	23	7	7.39	1.7782		4	38	22.7	14.001
23	23	8	54.08	1.7782	S.	4	24	21.9	14.025

MONDAY 4.

Hour.	Right Ascension. h	m	s	Diff. for 1 m. s	Declination.	°	′	″	Diff. for 1 m. ″
0	23	10	40.77	1.7782	S.	4	10	19.7	14.049
1	23	12	27.46	1.7782		3	56	16.0	14.072
2	23	14	14.16	1.7784		3	42	11.0	14.095
3	23	16	0.87	1.7787		3	28	4.6	14.117
4	23	17	47.60	1.7790		3	13	56.9	14.138
5	23	19	34.35	1.7793		2	59	48.0	14.159
6	23	21	21.12	1.7797		2	45	37.8	14.179
7	23	23	7.92	1.7803		2	31	26.5	14.198
8	23	24	54.76	1.7811		2	17	14.0	14.217
9	23	26	41.65	1.7818		2	3	0.4	14.235
10	23	28	28.58	1.7826		1	48	45.8	14.253
11	23	30	15.56	1.7835		1	34	30.1	14.270
12	23	32	2.60	1.7845		1	20	13.4	14.286
13	23	33	49.70	1.7855		1	5	55.8	14.301
14	23	35	36.86	1.7866		0	51	37.3	14.315
15	23	37	24.09	1.7878		0	37	18.0	14.328
16	23	39	11.39	1.7891		0	22	57.9	14.342
17	23	40	58.78	1.7905	S.	0	8	37.0	14.355
18	23	42	46.25	1.7919	N.	0	5	44.7	14.367
19	23	44	33.81	1.7935		0	20	7.1	14.377
20	23	46	21.47	1.7951		0	34	30.0	14.387
21	23	48	9.22	1.7967		0	48	53.5	14.397
22	23	49	57.07	1.7985		1	3	17.6	14.406
23	23	51	45.04	1.8005		1	17	42.2	14.414
24	23	53	33.13	1.8025	N.	1	32	7.3	14.422

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 53 33.13	1.8025	N. 1 32 7.3	14.422
1	23 55 21.34	1.8045	1 46 32.8	14.428
2	23 57 9.67	1.8065	2 0 58.6	14.433
3	23 58 58.12	1.8087	2 15 24.8	14.439
4	0 0 46.71	1.8111	2 29 51.3	14.443
5	0 2 35.45	1.8135	2 44 17.9	14.445
6	0 4 24.33	1.8159	2 58 44.7	14.448
7	0 6 13.36	1.8185	3 13 11.7	14.451
8	0 8 2.55	1.8211	3 27 38.8	14.452
9	0 9 51.89	1.8238	3 42 5.9	14.452
10	0 11 41.40	1.8267	3 56 33.0	14.452
11	0 13 31.09	1.8296	4 11 0.1	14.450
12	0 15 20.95	1.8325	4 25 27.0	14.448
13	0 17 10.99	1.8356	4 39 53.8	14.445
14	0 19 1.22	1.8388	4 54 20.4	14.441
15	0 20 51.64	1.8420	5 8 46.7	14.436
16	0 22 42.26	1.8453	5 23 12.7	14.430
17	0 24 33.08	1.8487	5 37 38.3	14.423
18	0 26 24.10	1.8522	5 52 3.5	14.416
19	0 28 15.34	1.8558	6 6 28.2	14.408
20	0 30 6.80	1.8595	6 20 52.4	14.399
21	0 31 58.48	1.8633	6 35 16.1	14.389
22	0 33 50.39	1.8671	6 49 39.1	14.378
23	0 35 42.53	1.8710	N. 7 4 1.4	14.366

WEDNESDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 37 34.91	1.8750	N. 7 18 23.0	14.353
1	0 39 27.53	1.8792	7 32 43.7	14.338
2	0 41 20.41	1.8834	7 47 3.6	14.324
3	0 43 13.54	1.8877	8 1 22.6	14.308
4	0 45 6.93	1.8921	8 15 40.6	14.291
5	0 47 0.59	1.8965	8 29 57.5	14.273
6	0 48 54.51	1.9010	8 44 13.3	14.254
7	0 50 48.71	1.9057	8 58 28.0	14.234
8	0 52 43.19	1.9104	9 12 41.4	14.213
9	0 54 37.96	1.9152	9 26 53.5	14.191
10	0 56 33.02	1.9202	9 41 4.3	14.168
11	0 58 28.38	1.9252	9 55 13.7	14.143
12	1 0 24.04	1.9302	10 9 21.5	14.118
13	1 2 20.00	1.9354	10 23 27.8	14.092
14	1 4 16.28	1.9407	10 37 32.5	14.063
15	1 6 12.88	1.9460	10 51 35.4	14.034
16	1 8 9.80	1.9513	11 5 36.6	14.005
17	1 10 7.04	1.9568	11 19 36.0	13.974
18	1 12 4.62	1.9625	11 33 33.5	13.942
19	1 14 2.54	1.9682	11 47 29.0	13.908
20	1 16 0.80	1.9739	12 1 22.5	13.874
21	1 17 59.41	1.9797	12 15 13.9	13.838
22	1 19 58.37	1.9857	12 29 3.1	13.801
23	1 21 57.69	1.9917	12 42 50.0	13.762
24	1 23 57.38	1.9978	N.12 56 34.5	13.722

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 23 57.38	1.9978	N.12 56 34.5	13.722
1	1 25 57.43	2.0040	13 10 16.6	13.682
2	1 27 57.86	2.0103	13 23 56.3	13.640
3	1 29 58.67	2.0167	13 37 33.4	13.596
4	1 31 59.86	2.0230	13 51 7.8	13.551
5	1 34 1.43	2.0295	14 4 39.5	13.505
6	1 36 3.40	2.0362	14 18 8.4	13.457
7	1 38 5.77	2.0428	14 31 34.4	13.408
8	1 40 8.54	2.0495	14 44 57.4	13.358
9	1 42 11.71	2.0563	14 58 17.3	13.306
10	1 44 15.30	2.0633	15 11 34.1	13.253
11	1 46 19.31	2.0703	15 24 47.6	13.198
12	1 48 23.73	2.0773	15 37 57.8	13.142
13	1 50 28.58	2.0844	15 51 4.6	13.084
14	1 52 33.86	2.0917	16 4 7.9	13.025
15	1 54 39.58	2.0990	16 17 7.6	12.964
16	1 56 45.74	2.1063	16 30 3.6	12.902
17	1 58 52.34	2.1137	16 42 55.9	12.839
18	2 0 59.39	2.1212	16 55 44.3	12.773
19	2 3 6.89	2.1288	17 8 28.7	12.707
20	2 5 14.85	2.1364	17 21 9.1	12.639
21	2 7 23.26	2.1441	17 33 45.4	12.569
22	2 9 32.14	2.1519	17 46 17.4	12.497
23	2 11 41.49	2.1597	N.17 58 45.1	12.424

FRIDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 13 51.30	2.1675	N.18 11 8.3	12.349
1	2 16 1.59	2.1755	18 23 27.0	12.272
2	2 18 12.36	2.1835	18 35 41.0	12.194
3	2 20 23.61	2.1915	18 47 50.3	12.115
4	2 22 35.34	2.1996	18 59 54.8	12.033
5	2 24 47.56	2.2077	19 11 54.3	11.950
6	2 27 0.27	2.2159	19 23 48.8	11.865
7	2 29 13.47	2.2242	19 35 38.1	11.778
8	2 31 27.17	2.2325	19 47 22.2	11.690
9	2 33 41.37	2.2408	19 59 0.9	11.599
10	2 35 56.07	2.2492	20 10 34.1	11.507
11	2 38 11.28	2.2577	20 22 1.7	11.413
12	2 40 26.99	2.2661	20 33 23.7	11.318
13	2 42 43.21	2.2746	20 44 39.9	11.221
14	2 44 59.94	2.2831	20 55 50.2	11.122
15	2 47 17.18	2.2916	21 6 54.5	11.020
16	2 49 34.93	2.3002	21 17 52.6	10.917
17	2 51 53.20	2.3088	21 28 44.5	10.812
18	2 54 11.99	2.3175	21 39 30.1	10.706
19	2 56 31.30	2.3261	21 50 9.2	10.597
20	2 58 51.12	2.3347	22 0 41.8	10.487
21	3 1 11.46	2.3433	22 11 7.7	10.375
22	3 3 32.32	2.3520	22 21 26.8	10.261
23	3 5 53.70	2.3607	22 31 39.0	10.144
24	3 8 15.60	2.3694	N.22 41 44.1	10.026

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 8 15.60	2.3694	N.22 41 44.1	10.026
1	3 10 38.03	2.3781	22 51 42.1	9.907
2	3 13 0.97	2.3867	23 1 32.9	9.785
3	3 15 24.43	2.3953	23 11 16.3	9.661
4	3 17 48.41	2.4040	23 20 52.2	9.535
5	3 20 12.91	2.4127	23 30 20.5	9.407
6	3 22 37.93	2.4213	23 39 41.1	9.278
7	3 25 3.46	2.4298	23 48 53.9	9.147
8	3 27 29.51	2.4384	23 57 58.7	9.013
9	3 29 56.07	2.4469	24 6 55.5	8.878
10	3 32 23.14	2.4554	24 15 44.1	8.741
11	3 34 50.72	2.4639	24 24 24.4	8.602
12	3 37 18.81	2.4723	24 32 56.3	8.461
13	3 39 47.40	2.4807	24 41 19.7	8.318
14	3 42 16.49	2.4890	24 49 34.5	8.173
15	3 44 46.08	2.4972	24 57 40.5	8.027
16	3 47 16.16	2.5054	25 5 37.7	7.879
17	3 49 46.73	2.5136	25 13 26.0	7.729
18	3 52 17.79	2.5217	25 21 5.2	7.577
19	3 54 49.33	2.5297	25 28 35.2	7.423
20	3 57 21.35	2.5377	25 35 55.9	7.267
21	3 59 53.85	2.5456	25 43 7.2	7.109
22	4 2 26.82	2.5533	25 50 9.0	6.949
23	4 5 0.25	2.5609	N.25 57 1.1	6.788

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 7 34.13	2.5685	N.26 3 43.5	6.625
1	4 10 8.47	2.5761	26 10 16.1	6.460
2	4 12 43.26	2.5834	26 16 38.7	6.293
3	4 15 18.48	2.5906	26 22 51.3	6.126
4	4 17 54.13	2.5977	26 28 53.8	5.956
5	4 20 30.21	2.6048	26 34 46.0	5.784
6	4 23 6.71	2.6117	26 40 27.9	5.611
7	4 25 43.62	2.6185	26 45 59.3	5.436
8	4 28 20.93	2.6252	26 51 20.2	5.260
9	4 30 58.64	2.6318	26 56 30.5	5.082
10	4 33 36.74	2.6382	27 1 30.1	4.903
11	4 36 15.22	2.6444	27 6 18.9	4.722
12	4 38 54.07	2.6505	27 10 56.7	4.539
13	4 41 33.28	2.6565	27 15 23.5	4.355
14	4 44 12.85	2.6623	27 19 39.3	4.171
15	4 46 52.76	2.6679	27 23 44.0	3.984
16	4 49 33.00	2.6734	27 27 37.4	3.796
17	4 52 13.57	2.6787	27 31 19.5	3.607
18	4 54 54.45	2.6839	27 34 50.2	3.416
19	4 57 35.64	2.6889	27 38 9.4	3.224
20	5 0 17.12	2.6937	27 41 17.1	3.032
21	5 2 58.88	2.6983	27 44 13.3	2.839
22	5 5 40.91	2.7028	27 46 57.8	2.643
23	5 8 23.21	2.7071	27 49 30.5	2.447
24	5 11 5.76	2.7112	N.27 51 51.4	2.250

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 11 5.76	2.7112	N.27 51 51.4	2.250
1	5 13 48.55	2.7150	27 54 0.5	2.052
2	5 16 31.56	2.7187	27 55 57.7	1.853
3	5 19 14.79	2.7222	27 57 42.9	1.653
4	5 21 58.22	2.7254	27 59 16.1	1.453
5	5 24 41.84	2.7286	28 0 37.3	1.252
6	5 27 25.65	2.7315	28 1 46.4	1.051
7	5 30 9.62	2.7342	28 2 43.4	0.848
8	5 32 53.75	2.7367	28 3 28.2	0.645
9	5 35 38.02	2.7389	28 4 0.8	0.441
10	5 38 22.42	2.7410	28 4 21.1	0.237
11	5 41 6.94	2.7428	28 4 29.2	+0.033
12	5 43 51.56	2.7445	28 4 25.0	−0.172
13	5 46 36.28	2.7459	28 4 8.5	0.378
14	5 49 21.07	2.7471	28 3 39.6	0.584
15	5 52 5.93	2.7482	28 2 58.4	0.790
16	5 54 50.85	2.7490	28 2 4.8	0.997
17	5 57 35.81	2.7496	28 0 58.8	1.202
18	6 0 20.80	2.7499	27 59 40.5	1.408
19	6 3 5.80	2.7501	27 58 9.8	1.615
20	6 5 50.81	2.7501	27 56 26.7	1.821
21	6 8 35.81	2.7498	27 54 31.3	2.027
22	6 11 20.78	2.7493	27 52 23.5	2.232
23	6 14 5.72	2.7486	N.27 50 3.4	2.438

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 16 50.61	2.7477	N.27 47 30.9	2.645
1	6 19 35.44	2.7466	27 44 46.0	2.850
2	6 22 20.20	2.7452	27 41 48.9	3.053
3	6 25 4.87	2.7437	27 38 39.6	3.257
4	6 27 49.45	2.7420	27 35 18.0	3.462
5	6 30 33.91	2.7400	27 31 44.2	3.666
6	6 33 18.25	2.7379	27 27 58.1	3.869
7	6 36 2.46	2.7356	27 23 59.9	4.071
8	6 38 46.52	2.7331	27 19 49.6	4.272
9	6 41 30.43	2.7304	27 15 27.2	4.473
10	6 44 14.17	2.7275	27 10 52.8	4.673
11	6 46 57.73	2.7244	27 6 6.4	4.873
12	6 49 41.10	2.7212	27 1 8.0	5.072
13	6 52 24.27	2.7177	26 55 57.7	5.269
14	6 55 7.22	2.7140	26 50 35.7	5.465
15	6 57 49.95	2.7102	26 45 1.9	5.661
16	7 0 32.45	2.7062	26 39 16.4	5.855
17	7 3 14.70	2.7021	26 33 19.3	6.048
18	7 5 56.70	2.6978	26 27 10.6	6.241
19	7 8 38.44	2.6934	26 20 50.4	6.432
20	7 11 19.91	2.6887	26 14 18.8	6.621
21	7 14 1.09	2.6839	26 7 35.9	6.809
22	7 16 41.98	2.6791	26 0 41.7	6.997
23	7 19 22.58	2.6741	25 53 36.3	7.182
24	7 22 2.87	2.6689	N.25 46 19.9	7.365

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 22 2.87	2.6689	N.25 46 19.9	7.365
1	7 24 42.85	2.6636	25 38 52.5	7.548
2	7 27 22.50	2.6580	25 31 14.1	7.731
3	7 30 1.81	2.6523	25 23 24.8	7.911
4	7 32 40.78	2.6467	25 15 24.8	8.089
5	7 35 19.41	2.6409	25 7 14.1	8.266
6	7 37 57.69	2.6350	24 58 52.9	8.441
7	7 40 35.61	2.6289	24 50 21.2	8.615
8	7 43 13.16	2.6227	24 41 39.1	8.787
9	7 45 50.34	2.6165	24 32 46.8	8.957
10	7 48 27.14	2.6101	24 23 44.3	9.125
11	7 51 3.55	2.6037	24 14 31.8	9.292
12	7 53 39.58	2.5972	24 5 9.3	9.457
13	7 56 15.21	2.5906	23 55 36.9	9.621
14	7 58 50.44	2.5838	23 45 54.8	9.782
15	8 1 25.27	2.5771	23 36 3.1	9.941
16	8 3 59.69	2.5702	23 26 1.9	10.099
17	8 6 33.70	2.5633	23 15 51.2	10.256
18	8 9 7.29	2.5563	23 5 31.2	10.410
19	8 11 40.46	2.5493	22 55 2.0	10.562
20	8 14 13.21	2.5423	22 44 23.8	10.712
21	8 16 45.54	2.5353	22 33 36.6	10.860
22	8 19 17.44	2.5281	22 22 40.6	11.006
23	8 21 48.91	2.5208	N.22 11 35.9	11.151

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 24 19.94	2.5136	N.22 0 22.5	11.293
1	8 26 50.54	2.5063	21 49 0.7	11.433
2	8 29 20.70	2.4991	21 37 30.5	11.572
3	8 31 50.43	2.4918	21 25 52.0	11.709
4	8 34 19.72	2.4845	21 14 5.4	11.843
5	8 36 48.57	2.4771	21 2 10.8	11.976
6	8 39 16.97	2.4697	20 50 8.3	12.106
7	8 41 44.93	2.4623	20 37 58.1	12.234
8	8 44 12.45	2.4551	20 25 40.2	12.362
9	8 46 39.54	2.4477	20 13 14.7	12.487
10	8 49 6.18	2.4403	20 0 41.8	12.608
11	8 51 32.38	2.4329	19 48 1.7	12.728
12	8 53 58.13	2.4255	19 35 14.5	12.846
13	8 56 23.44	2.4182	19 22 20.2	12.963
14	8 58 48.32	2.4110	19 9 19.0	13.077
15	9 1 12.76	2.4037	18 56 11.0	13.188
16	9 3 36.76	2.3964	18 42 56.4	13.298
17	9 6 0.33	2.3892	18 29 35.2	13.407
18	9 8 23.46	2.3819	18 16 7.5	13.514
19	9 10 46.16	2.3747	18 2 33.5	13.618
20	9 13 8.43	2.3676	17 48 53.4	13.719
21	9 15 30.27	2.3604	17 35 7.2	13.819
22	9 17 51.68	2.3533	17 21 15.1	13.917
23	9 20 12.67	2.3463	17 7 17.2	14.013
24	9 22 33.24	2.3393	N.16 53 13.5	14.107

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 22 33.24	2.3393	N.16 53 13.5	14.107
1	9 24 53.39	2.3324	16 39 4.3	14.199
2	9 27 13.13	2.3256	16 24 49.6	14.289
3	9 29 32.46	2.3188	16 10 29.6	14.377
4	9 31 51.38	2.3120	15 56 4.4	14.463
5	9 34 9.90	2.3052	15 41 34.1	14.548
6	9 36 28.01	2.2985	15 26 58.7	14.630
7	9 38 45.72	2.2918	15 12 18.5	14.709
8	9 41 3.03	2.2852	14 57 33.6	14.787
9	9 43 19.95	2.2787	14 42 44.0	14.864
10	9 45 36.48	2.2723	14 27 49.9	14.938
11	9 47 52.63	2.2660	14 12 51.4	15.011
12	9 50 8.40	2.2597	13 57 48.6	15.082
13	9 52 23.79	2.2535	13 42 41.6	15.150
14	9 54 38.82	2.2474	13 27 30.6	15.217
15	9 56 53.48	2.2413	13 12 15.6	15.282
16	9 59 7.78	2.2353	12 56 56.8	15.344
17	10 1 21.72	2.2293	12 41 34.3	15.406
18	10 3 35.30	2.2235	12 26 8.1	15.466
19	10 5 48.54	2.2177	12 10 38.4	15.523
20	10 8 1.43	2.2120	11 55 5.3	15.579
21	10 10 13.98	2.2064	11 39 28.9	15.633
22	10 12 26.20	2.2009	11 23 49.3	15.686
23	10 14 38.09	2.1954	N.11 8 6.6	15.736

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 16 49.65	2.1900	N.10 52 21.0	15.784
1	10 19 0.89	2.1848	10 36 32.5	15.832
2	10 21 11.82	2.1797	10 20 41.2	15.877
3	10 23 22.45	2.1746	10 4 47.3	15.920
4	10 25 32.77	2.1695	9 48 50.8	15.962
5	10 27 42.79	2.1645	9 32 51.9	16.002
6	10 29 52.51	2.1597	9 16 50.6	16.040
7	10 32 1.95	2.1550	9 0 47.1	16.077
8	10 34 11.11	2.1502	8 44 41.4	16.112
9	10 36 19.98	2.1456	8 28 33.6	16.146
10	10 38 28.58	2.1412	8 12 23.9	16.177
11	10 40 36.92	2.1368	7 56 12.3	16.207
12	10 42 45.00	2.1325	7 39 59.0	16.236
13	10 44 52.82	2.1283	7 23 44.0	16.263
14	10 47 0.39	2.1242	7 7 27.5	16.288
15	10 49 7.72	2.1202	6 51 9.5	16.312
16	10 51 14.81	2.1162	6 34 50.1	16.334
17	10 53 21.67	2.1123	6 18 29.4	16.354
18	10 55 28.29	2.1085	6 2 7.6	16.373
19	10 57 34.69	2.1049	5 45 44.7	16.391
20	10 59 40.88	2.1013	5 29 20.7	16.407
21	11 1 46.85	2.0978	5 12 55.8	16.422
22	11 3 52.62	2.0945	4 56 30.1	16.434
23	11 5 58.19	2.0912	4 40 3.7	16.446
24	11 8 3.57	2.0881	N. 4 23 36.6	16.456

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	11	8	3.57	2.0881	N.	4	23	36.6	16.456
1	11	10	8.76	2.0850		4	7	9.0	16.464
2	11	12	13.77	2.0820		3	50	40.9	16.472
3	11	14	18.60	2.0791		3	34	12.4	16.478
4	11	16	23.26	2.0762		3	17	43.6	16.482
5	11	18	27.75	2.0735		3	1	14.6	16.483
6	11	20	32.08	2.0709		2	44	45.6	16.484
7	11	22	36.26	2.0684		2	28	16.5	16.485
8	11	24	40.29	2.0659		2	11	47.4	16.484
9	11	26	44.17	2.0636		1	55	18.4	16.481
10	11	28	47.92	2.0614		1	38	49.7	16.476
11	11	30	51.54	2.0593		1	22	21.3	16.471
12	11	32	55.03	2.0572		1	5	53.2	16.464
13	11	34	58.40	2.0552		0	49	25.6	16.456
14	11	37	1.66	2.0534		0	32	58.5	16.446
15	11	39	4.81	2.0516		0	16	32.1	16.434
16	11	41	7.85	2.0499	N.	0	0	6.4	16.422
17	11	43	10.80	2.0483	S.	0	16	18.5	16.408
18	11	45	13.65	2.0468		0	32	42.6	16.393
19	11	47	16.41	2.0454		0	49	5.7	16.377
20	11	49	19.10	2.0442		1	5	27.8	16.359
21	11	51	21.71	2.0429		1	21	48.8	16.340
22	11	53	24.25	2.0417		1	38	8.6	16.320
23	11	55	26.72	2.0407	S.	1	54	27.2	16.298

MONDAY 18.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
0	11	57	29.14	2.0398	S.	2	10	44.4	16.275
1	11	59	31.50	2.0389		2	27	0.2	16.251
2	12	1	33.81	2.0382		2	43	14.5	16.226
3	12	3	36.08	2.0375		2	59	27.3	16.200
4	12	5	38.31	2.0368		3	15	38.5	16.172
5	12	7	40.50	2.0363		3	31	48.0	16.143
6	12	9	42.67	2.0360		3	47	55.6	16.113
7	12	11	44.82	2.0357		4	4	1.4	16.081
8	12	13	46.95	2.0354		4	20	5.3	16.048
9	12	15	49.07	2.0352		4	36	7.2	16.014
10	12	17	51.18	2.0352		4	52	7.0	15.979
11	12	19	53.29	2.0352		5	8	4.7	15.942
12	12	21	55.41	2.0353		5	24	0.1	15.904
13	12	23	57.53	2.0355		5	39	53.2	15.866
14	12	25	59.67	2.0358		5	55	44.0	15.827
15	12	28	1.83	2.0362		6	11	32.4	15.785
16	12	30	4.01	2.0366		6	27	18.2	15.742
17	12	32	6.22	2.0372		6	43	1.4	15.698
18	12	34	8.47	2.0378		6	58	42.0	15.654
19	12	36	10.76	2.0385		7	14	19.9	15.608
20	12	38	13.09	2.0392		7	29	54.9	15.560
21	12	40	15.46	2.0399		7	45	27.1	15.512
22	12	42	17.88	2.0409		8	0	56.4	15.463
23	12	44	20.37	2.0420		8	16	22.7	15.412
24	12	46	22.92	2.0430	S.	8	31	45.9	15.361

TUESDAY 19.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	12	46	22.92	2.0430	S.	8	31	45.9	15.361
1	12	48	25.53	2.0442		8	47	6.0	15.308
2	12	50	28.22	2.0455		9	2	22.9	15.253
3	12	52	30.99	2.0468		9	17	36.4	15.198
4	12	54	33.84	2.0482		9	32	46.6	15.143
5	12	56	36.77	2.0496		9	47	53.4	15.085
6	12	58	39.79	2.0511		10	2	56.8	15.027
7	13	0	42.90	2.0527		10	17	56.6	14.967
8	13	2	46.11	2.0544		10	32	52.8	14.905
9	13	4	49.43	2.0562		10	47	45.2	14.843
10	13	6	52.86	2.0580		11	2	33.9	14.780
11	13	8	56.39	2.0598		11	17	18.8	14.716
12	13	11	0.04	2.0618		11	31	59.8	14.650
13	13	13	3.81	2.0638		11	46	36.8	14.583
14	13	15	7.70	2.0659		12	1	9.8	14.516
15	13	17	11.72	2.0681		12	15	38.7	14.447
16	13	19	15.87	2.0703		12	30	3.4	14.377
17	13	21	20.16	2.0726		12	44	23.9	14.306
18	13	23	24.58	2.0749		12	58	40.1	14.233
19	13	25	29.15	2.0773		13	12	51.9	14.160
20	13	27	33.86	2.0797		13	26	59.3	14.086
21	13	29	38.72	2.0822		13	41	2.2	14.010
22	13	31	43.73	2.0848		13	55	0.5	13.933
23	13	33	48.90	2.0875	S.	14	8	54.2	13.856

WEDNESDAY 20.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
0	13	35	54.23	2.0902	S.	14	22	43.2	13.777
1	13	37	59.72	2.0929		14	36	27.4	13.697
2	13	40	5.38	2.0957		14	50	6.8	13.616
3	13	42	11.20	2.0986		15	3	41.3	13.533
4	13	44	17.20	2.1015		15	17	10.8	13.450
5	13	46	23.38	2.1044		15	30	35.3	13.366
6	13	48	29.73	2.1074		15	43	54.7	13.280
7	13	50	36.27	2.1105		15	57	8.9	13.193
8	13	52	42.99	2.1135		16	10	17.9	13.106
9	13	54	49.89	2.1166		16	23	21.7	13.018
10	13	56	56.98	2.1198		16	36	20.1	12.928
11	13	59	4.26	2.1230		16	49	13.1	12.837
12	14	1	11.74	2.1262		17	2	0.5	12.744
13	14	3	19.41	2.1295		17	14	42.3	12.651
14	14	5	27.28	2.1328		17	27	18.6	12.558
15	14	7	35.35	2.1362		17	39	49.3	12.463
16	14	9	43.62	2.1396		17	52	14.2	12.367
17	14	11	52.10	2.1431		18	4	33.3	12.269
18	14	14	0.79	2.1465		18	16	46.5	12.171
19	14	16	9.68	2.1499		18	28	53.8	12.072
20	14	18	18.78	2.1535		18	40	55.1	11.971
21	14	20	28.10	2.1571		18	52	50.3	11.869
22	14	22	37.63	2.1606		19	4	39.4	11.767
23	14	24	47.37	2.1641		19	16	22.3	11.663
24	14	26	57.32	2.1677	S.	19	27	59.0	11.559

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 26 57.32	2.1677	S. 19 27 59.0	11.559
1	14 29 7.49	2.1713	19 39 29.4	11.453
2	14 31 17.88	2.1749	19 50 53.4	11.346
3	14 33 28.48	2.1785	20 2 10.9	11.238
4	14 35 39.30	2.1822	20 13 21.9	11.129
5	14 37 50.34	2.1859	20 24 26.4	11.020
6	14 40 1.61	2.1897	20 35 24.3	10.909
7	14 42 13.10	2.1933	20 46 15.5	10.797
8	14 44 24.81	2.1969	20 57 0.0	10.684
9	14 46 36.73	2.2006	21 7 37.6	10.570
10	14 48 48.88	2.2043	21 18 8.4	10.456
11	14 51 1.25	2.2080	21 28 32.3	10.341
12	14 53 13.84	2.2117	21 38 49.3	10.224
13	14 55 26.65	2.2153	21 48 59.2	10.106
14	14 57 39.68	2.2191	21 59 2.0	9.987
15	14 59 52.94	2.2228	22 8 57.7	9.868
16	15 2 6.42	2.2264	22 18 46.2	9.747
17	15 4 20.11	2.2300	22 28 27.4	9.626
18	15 6 34.02	2.2337	22 38 1.3	9.503
19	15 8 48.15	2.2373	22 47 27.8	9.380
20	15 11 2.49	2.2408	22 56 46.9	9.256
21	15 13 17.05	2.2444	23 5 58.5	9.131
22	15 15 31.82	2.2479	23 15 2.6	9.005
23	15 17 46.80	2.2515	S. 23 23 59.1	8.878

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 20 2.00	2.2550	S. 23 32 48.0	8.751
1	15 22 17.40	2.2584	23 41 29.2	8.622
2	15 24 33.01	2.2618	23 50 2.6	8.492
3	15 26 48.82	2.2653	23 58 28.3	8.362
4	15 29 4.84	2.2687	24 6 46.1	8.231
5	15 31 21.06	2.2719	24 14 56.0	8.099
6	15 33 37.47	2.2752	24 22 58.0	7.967
7	15 35 54.08	2.2784	24 30 52.0	7.833
8	15 38 10.88	2.2817	24 38 37.9	7.698
9	15 40 27.88	2.2848	24 46 15.8	7.564
10	15 42 45.06	2.2879	24 53 45.6	7.428
11	15 45 2.43	2.2910	25 1 7.2	7.292
12	15 47 19.98	2.2940	25 8 20.6	7.155
13	15 49 37.71	2.2969	25 15 25.8	7.017
14	15 51 55.61	2.2998	25 22 22.7	6.878
15	15 54 13.68	2.3026	25 29 11.2	6.738
16	15 56 31.92	2.3053	25 35 51.3	6.599
17	15 58 50.32	2.3081	25 42 23.1	6.459
18	16 1 8.89	2.3108	25 48 46.4	6.318
19	16 3 27.61	2.3133	25 55 1.2	6.176
20	16 5 46.48	2.3158	26 1 7.5	6.033
21	16 8 5.50	2.3182	26 7 5.2	5.891
22	16 10 24.66	2.3205	26 12 54.4	5.747
23	16 12 43.96	2.3227	26 18 34.9	5.603
24	16 15 3.39	2.3249	S. 26 24 6.8	5.459

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 15 3.39	2.3249	S. 26 24 6.8	5.459
1	16 17 22.95	2.3271	26 29 30.0	5.314
2	16 19 42.64	2.3292	26 34 44.5	5.168
3	16 22 2.45	2.3312	26 39 50.2	5.023
4	16 24 22.38	2.3330	26 44 47.2	4.877
5	16 26 42.41	2.3348	26 49 35.4	4.729
6	16 29 2.55	2.3365	26 54 14.7	4.582
7	16 31 22.79	2.3381	26 58 45.2	4.434
8	16 33 43.12	2.3397	27 3 6.8	4.287
9	16 36 3.55	2.3412	27 7 19.6	4.138
10	16 38 24.06	2.3425	27 11 23.4	3.989
11	16 40 44.65	2.3437	27 15 18.3	3.840
12	16 43 5.31	2.3449	27 19 4.2	3.691
13	16 45 26.04	2.3460	27 22 41.2	3.542
14	16 47 46.83	2.3469	27 26 9.2	3.392
15	16 50 7.67	2.3478	27 29 28.2	3.242
16	16 52 28.56	2.3486	27 32 38.2	3.092
17	16 54 49.50	2.3493	27 35 39.2	2.941
18	16 57 10.48	2.3499	27 38 31.1	2.790
19	16 59 31.49	2.3503	27 41 14.0	2.640
20	17 1 52.52	2.3507	27 43 47.9	2.489
21	17 4 13.58	2.3511	27 46 12.7	2.338
22	17 6 34.65	2.3513	27 48 28.4	2.187
23	17 8 55.73	2.3513	S. 27 50 35.1	2.036

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 11 16.80	2.3512	S. 27 52 32.7	1.885
1	17 13 37.87	2.3511	27 54 21.3	1.734
2	17 15 58.93	2.3508	27 56 0.8	1.583
3	17 18 19.97	2.3504	27 57 31.2	1.432
4	17 20 40.98	2.3500	27 58 52.6	1.281
5	17 23 1.97	2.3495	28 0 4.9	1.130
6	17 25 22.92	2.3488	28 1 8.2	0.979
7	17 27 43.82	2.3480	28 2 2.4	0.828
8	17 30 4.68	2.3472	28 2 47.6	0.678
9	17 32 25.48	2.3462	28 3 23.8	0.527
10	17 34 46.22	2.3451	28 3 50.9	0.377
11	17 37 6.89	2.3439	28 4 9.0	0.227
12	17 39 27.49	2.3427	28 4 18.2	−0.078
13	17 41 48.01	2.3413	28 4 18.4	+0.072
14	17 44 8.44	2.3397	28 4 9.6	0.221
15	17 46 28.77	2.3380	28 3 51.9	0.370
16	17 48 49.00	2.3363	28 3 25.2	0.518
17	17 51 9.13	2.3346	28 2 49.7	0.666
18	17 53 29.15	2.3327	28 2 5.3	0.814
19	17 55 49.05	2.3307	28 1 12.0	0.962
20	17 58 8.83	2.3286	28 0 9.9	1.108
21	18 0 28.48	2.3263	27 58 59.0	1.255
22	18 2 47.99	2.3240	27 57 39.3	1.402
23	18 5 7.36	2.3216	27 56 10.8	1.548
24	18 7 26.58	2.3190	S. 27 54 33.6	1.693

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 7 26.58	2.3190	S.27 54 33.6	1.693
1	18 9 45.64	2.3164	27 52 47.7	1.837
2	18 12 4.55	2.3138	27 50 53.2	1.981
3	18 14 23.30	2.3111	27 48 50.0	2.125
4	18 16 41.88	2.3082	27 46 38.2	2.268
5	18 19 0.28	2.3051	27 44 17.8	2.411
6	18 21 18.49	2.3020	27 41 48.9	2.553
7	18 23 36.52	2.2989	27 39 11.5	2.694
8	18 25 54.36	2.2957	27 36 25.6	2.835
9	18 28 12.00	2.2923	27 33 31.3	2.975
10	18 30 29.44	2.2889	27 30 28.6	3.114
11	18 32 46.67	2.2855	27 27 17.6	3.253
12	18 35 3.70	2.2820	27 23 58.3	3.391
13	18 37 20.51	2.2783	27 20 30.7	3.528
14	18 39 37.09	2.2745	27 16 54.9	3.665
15	18 41 53.45	2.2707	27 13 10.9	3.801
16	18 44 9.58	2.2669	27 9 18.8	3.936
17	18 46 25.48	2.2630	27 5 18.6	4.071
18	18 48 41.14	2.2590	27 1 10.3	4.205
19	18 50 56.56	2.2549	26 56 54.0	4.337
20	18 53 11.73	2.2508	26 52 29.8	4.469
21	18 55 26.65	2.2466	26 47 57.7	4.601
22	18 57 41.32	2.2423	26 43 17.7	4.731
23	18 59 55.73	2.2380	S.26 38 30.0	4.860

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 2 9.88	2.2337	S.26 33 34.5	4.989
1	19 4 23.77	2.2292	26 28 31.3	5.117
2	19 6 37.39	2.2247	26 23 20.5	5.244
3	19 8 50.73	2.2201	26 18 2.0	5.371
4	19 11 3.80	2.2155	26 12 35.9	5.497
5	19 13 16.59	2.2108	26 7 2.4	5.620
6	19 15 29.10	2.2062	26 1 21.5	5.743
7	19 17 41.33	2.2014	25 55 33.2	5.866
8	19 19 53.27	2.1967	25 49 37.5	5.988
9	19 22 4.93	2.1919	25 43 34.6	6.109
10	19 24 16.30	2.1870	25 37 24.4	6.229
11	19 26 27.37	2.1820	25 31 7.1	6.347
12	19 28 38.14	2.1771	25 24 42.7	6.465
13	19 30 48.62	2.1722	25 18 11.3	6.582
14	19 32 58.80	2.1672	25 11 32.8	6.699
15	19 35 8.68	2.1622	25 4 47.4	6.814
16	19 37 18.26	2.1572	24 57 55.1	6.928
17	19 39 27.54	2.1521	24 50 56.0	7.041
18	19 41 36.51	2.1469	24 43 50.2	7.153
19	19 43 45.17	2.1418	24 36 37.7	7.264
20	19 45 53.53	2.1367	24 29 18.5	7.375
21	19 48 1.58	2.1316	24 21 52.7	7.484
22	19 50 9.32	2.1264	24 14 20.4	7.592
23	19 52 16.75	2.1213	24 6 41.6	7.700
24	19 54 23.87	2.1161	S.23 58 56.4	7.806

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 54 23.87	2.1161	S.23 58 56.4	7.806
1	19 56 30.68	2.1108	23 51 4.9	7.911
2	19 58 37.17	2.1056	23 43 7.1	8.016
3	20 0 43.35	2.1004	23 35 3.0	8.120
4	20 2 49.22	2.0952	23 26 52.7	8.222
5	20 4 54.78	2.0900	23 18 36.4	8.322
6	20 7 0.02	2.0848	23 10 14.1	8.422
7	20 9 4.95	2.0796	23 1 45.8	8.522
8	20 11 9.57	2.0743	22 53 11.5	8.621
9	20 13 13.87	2.0691	22 44 31.3	8.718
10	20 15 17.86	2.0638	22 35 45.3	8.815
11	20 17 21.53	2.0586	22 26 53.5	8.910
12	20 19 24.89	2.0534	22 17 56.1	9.003
13	20 21 27.94	2.0482	22 8 53.1	9.097
14	20 23 30.68	2.0431	21 59 44.5	9.190
15	20 25 33.11	2.0379	21 50 30.3	9.282
16	20 27 35.23	2.0328	21 41 10.7	9.372
17	20 29 37.05	2.0277	21 31 45.7	9.461
18	20 31 38.56	2.0226	21 22 15.4	9.549
19	20 33 39.76	2.0175	21 12 39.8	9.637
20	20 35 40.66	2.0125	21 2 59.0	9.723
21	20 37 41.26	2.0075	20 53 13.1	9.808
22	20 39 41.56	2.0024	20 43 22.1	9.893
23	20 41 41.55	1.9973	S.20 33 26.0	9.977

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 43 41.24	1.9924	S.20 23 24.9	10.059
1	20 45 40.64	1.9875	20 13 18.9	10.141
2	20 47 39.74	1.9826	20 3 8.0	10.221
3	20 49 38.55	1.9777	19 52 52.4	10.300
4	20 51 37.06	1.9728	19 42 32.0	10.379
5	20 53 35.29	1.9681	19 32 6.9	10.457
6	20 55 33.23	1.9633	19 21 37.1	10.534
7	20 57 30.88	1.9585	19 11 2.8	10.609
8	20 59 28.25	1.9538	19 0 24.0	10.685
9	21 1 25.34	1.9492	18 49 40.6	10.760
10	21 3 22.15	1.9445	18 38 52.8	10.832
11	21 5 18.68	1.9399	18 28 0.7	10.904
12	21 7 14.94	1.9354	18 17 4.3	10.976
13	21 9 10.93	1.9309	18 6 3.6	11.046
14	21 11 6.65	1.9263	17 54 58.8	11.115
15	21 13 2.09	1.9219	17 43 49.8	11.184
16	21 14 57.27	1.9176	17 32 36.7	11.252
17	21 16 52.20	1.9133	17 21 19.6	11.318
18	21 18 46.87	1.9090	17 9 58.5	11.384
19	21 20 41.28	1.9048	16 58 33.5	11.449
20	21 22 35.44	1.9006	16 47 4.6	11.513
21	21 24 29.35	1.8964	16 35 31.9	11.577
22	21 26 23.01	1.8923	16 23 55.4	11.639
23	21 28 16.43	1.8883	16 12 15.2	11.701
24	21 30 9.61	1.8843	S.16 0 31.3	11.762

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 30 9.61	1.8843	S. 16 0 31.3	11.762
1	21 32 2.55	1.8804	15 48 43.8	11.821
2	21 33 55.26	1.8765	15 36 52.8	11.880
3	21 35 47.73	1.8726	15 24 58.2	11.939
4	21 37 39.97	1.8688	15 13 0.1	11.996
5	21 39 31.99	1.8652	15 0 58.7	12.052
6	21 41 23.79	1.8615	14 48 53.9	12.108
7	21 43 15.37	1.8579	14 36 45.8	12.163
8	21 45 6.74	1.8543	14 24 34.4	12.218
9	21 46 57.89	1.8508	14 12 19.7	12.271
10	21 48 48.84	1.8474	14 0 1.9	12.323
11	21 50 39.58	1.8440	13 47 41.0	12.374
12	21 52 30.12	1.8407	13 35 17.0	12.425
13	21 54 20.46	1.8374	13 22 50.0	12.475
14	21 56 10.61	1.8342	13 10 20.0	12.524
15	21 58 0.57	1.8311	12 57 47.1	12.572
16	21 59 50.34	1.8280	12 45 11.3	12.620
17	22 1 39.93	1.8250	12 32 32.7	12.667
18	22 3 29.34	1.8220	12 19 51.2	12.714
19	22 5 18.57	1.8192	12 7 7.0	12.759
20	22 7 7.64	1.8164	11 54 20.1	12.803
21	22 8 56.54	1.8136	11 41 30.6	12.847
22	22 10 45.27	1.8108	11 28 38.5	12.890
23	22 12 33.84	1.8082	11 15 43.8	12.933
24	22 14 22.26	1.8057	S. 11 2 46.5	12.975

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	22 14 22.26	1.8057	S. 11 2 46.5	12.975
1	22 16 10.53	1.8032	10 49 46.8	13.015
2	22 17 58.65	1.8007	10 36 44.7	13.056
3	22 19 46.62	1.7983	10 23 40.1	13.096
4	22 21 34.45	1.7961	10 10 33.2	13.134
5	22 23 22.15	1.7939	9 57 24.0	13.172
6	22 25 9.71	1.7917	9 44 12.6	13.209
7	22 26 57.15	1.7896	9 30 58.9	13.246
8	22 28 44.46	1.7875	9 17 43.1	13.282
9	22 30 31.65	1.7855	9 4 25.1	13.317
10	22 32 18.72	1.7837	8 51 5.0	13.352
11	22 34 5.69	1.7819	8 37 42.9	13.385
12	22 35 52.55	1.7802	8 24 18.8	13.418
13	22 37 39.31	1.7785	8 10 52.7	13.451
14	22 39 25.97	1.7768	7 57 24.7	13.483
15	22 41 12.53	1.7752	7 43 54.8	13.514
16	22 42 59.00	1.7738	7 30 23.0	13.544
17	22 44 45.39	1.7724	7 16 49.5	13.573
18	22 46 31.69	1.7711	7 3 14.2	13.602
19	22 48 17.92	1.7698	6 49 37.2	13.631
20	22 50 4.07	1.7686	6 35 58.5	13.658
21	22 51 50.15	1.7675	6 22 18.2	13.685
22	22 53 36.17	1.7665	6 8 36.3	13.712
23	22 55 22.13	1.7656	5 54 52.8	13.738
24	22 57 8.04	1.7647	S. 5 41 7.8	13.763

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, ...	3	17	11.0
● New Moon, ...	11	2	32.5
☽ First Quarter, ...	17	18	24.4
○ Full Moon, ...	25	4	52.7

	d	h
☾ Apogee, ...	1	14.1
☾ Perigee, ...	13	12.0
☾ Apogee, ...	29	6.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Antares	W.	63° 21′ 40″	3060	64° 50′ 38″	3063	66° 19′ 33″	3065	67° 48′ 26″	3068
	Jupiter	W.	40 32 29	3055	42 1 34	3056	43 30 38	3056	44 59 42	3056
	Saturn	E.	38 6 57	3096	36 38 42	3099	35 10 31	3103	33 42 25	3105
	α Arietis	E.	84 53 42	3081	83 25 9	3083	81 56 39	3085	80 28 11	3087
	Sun	E.	119 31 24	3449	118 10 3	3451	116 48 44	3453	115 27 27	3454
2	Antares	W.	75 12 33	3068	76 41 22	3066	78 10 13	3065	79 39 5	3063
	Jupiter	W.	52 25 11	3051	53 54 21	3048	55 23 34	3046	56 52 50	3043
	α Aquilæ	W.	37 37 6	6050	38 21 48	5846	39 8 39	5663	39 57 31	5497
	Saturn	E.	26 22 48	3190	24 55 3	3194	23 27 22	3197	21 59 45	3131
	α Arietis	E.	73 6 17	3090	71 37 55	3089	70 9 32	3088	68 41 8	3087
	Sun	E.	108 41 12	3453	107 19 55	3452	105 58 37	3450	104 37 17	3447
3	Antares	W.	87 4 16	3047	88 33 31	3041	90 2 53	3036	91 32 21	3030
	Jupiter	W.	64 20 13	3023	65 49 57	3018	67 19 48	3012	68 49 46	3006
	α Aquilæ	W.	44 28 16	4861	45 27 2	4764	46 27 8	4673	47 28 30	4590
	α Arietis	E.	61 18 29	3073	59 49 46	3069	58 20 58	3064	56 52 4	3060
	Sun	E.	97 49 45	3429	96 28 1	3423	95 6 10	3417	93 44 13	3410
4	Jupiter	W.	76 21 41	2969	77 52 33	2960	79 23 36	2950	80 54 51	2942
	α Aquilæ	W.	52 52 4	4248	53 59 45	4192	55 8 19	4139	56 17 43	4088
	Mars	W.	18 50 44	3216	20 16 34	3203	21 42 40	3190	23 9 1	3178
	α Arietis	E.	49 26 1	3030	47 56 26	3023	46 26 42	3017	44 56 50	3009
	Sun	E.	86 52 26	3372	85 29 37	3368	84 6 37	3358	82 43 26	3343
5	Jupiter	W.	88 34 14	2888	90 6 48	2876	91 39 38	2864	93 12 43	2851
	α Aquilæ	W.	62 16 12	3873	63 29 59	3835	64 44 25	3799	65 59 28	3765
	Fomalhaut	W.	35 8 11	3911	36 21 20	3828	37 35 53	3753	38 51 44	3685
	Mars	W.	30 24 26	3115	31 52 17	3101	33 20 25	3088	34 48 49	3073
	α Arietis	E.	37 25 10	2972	35 54 22	2964	34 23 24	2957	32 52 17	2950
	Sun	E.	75 44 27	3285	74 19 58	3273	72 55 15	3259	71 30 16	3246
6	Jupiter	W.	101 2 20	2784	102 37 9	2770	104 12 16	2756	105 47 42	2741
	α Aquilæ	W.	72 23 15	3611	73 41 37	3585	75 0 28	3557	76 19 49	3532
	Fomalhaut	W.	45 27 41	3409	46 49 47	3365	48 12 44	3323	49 36 29	3282
	Mars	W.	42 15 18	2999	43 45 32	2984	45 16 5	2968	46 46 58	2951
	α Pegasi	W.	25 18 50	4297	26 25 45	4196	27 35 22	4075	28 47 26	3945
	Saturn	W.	22 11 52	2867	23 44 53	2847	25 18 20	2828	26 52 11	2809
	Sun	E.	64 21 15	3174	62 54 35	3158	61 27 36	3143	60 0 19	3127
7	Fomalhaut	W.	56 46 19	3108	58 14 19	3078	59 42 56	3047	61 12 10	3019
	Mars	W.	54 26 37	2868	55 59 37	2851	57 32 59	2833	59 6 44	2816
	α Pegasi	W.	35 17 2	3379	36 39 42	3313	38 3 39	3251	39 28 48	3195
	Saturn	W.	34 47 30	2719	36 23 45	2701	38 0 24	2683	39 37 27	2665
	Sun .	E.	52 39 0	3046	51 9 44	3030	49 40 8	3014	48 10 12	2997
8	Fomalhaut	W.	68 46 51	2889	70 19 24	2866	71 52 27	2843	73 25 59	2821
	Mars	W.	67 1 10	2728	68 37 13	2710	70 13 39	2693	71 50 28	2675
	Saturn	W.	47 48 39	2577	49 28 5	2560	51 7 55	2543	52 48 9	2525
	α Pegasi	W.	46 49 57	2965	48 20 53	2928	49 52 36	2893	51 25 4	2859
	Sun	E.	40 35 23	2916	39 3 24	2901	37 31 6	2886	35 58 29	2871
9	Fomalhaut	W.	81 20 34	2721	82 56 46	2703	84 33 22	2686	86 10 21	2670

GREENWICH MEAN TIME.

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares	W.	69° 17′ 17″	3067	70° 46′ 7″	3068	72° 14′ 56″	3069	73° 43′ 44″	3068
	Jupiter	W.	46 28 46	3055	47 57 51	3055	49 26 56	3053	50 56 3	3052
	Saturn	E.	32 14 22	3109	30 46 23	3112	29 18 28	3114	27 50 36	3118
	α Ariotis	E.	78 59 46	3089	77 31 23	3089	76 3 0	3090	74 34 38	3091
	Sun	E.	114 6 11	3454	112 44 56	3455	111 23 42	3454	110 2 27	3454
2	Antares	W.	81 8 0	3060	82 36 58	3057	84 6 0	3054	85 35 6	3051
	Jupiter	W.	58 22 10	3039	59 51 34	3036	61 21 2	3032	62 50 35	3028
	α Aquilæ	W.	40 48 17	5347	41 40 50	5209	42 35 5	5084	43 30 55	4967
	Saturn	E.	20 32 13	3136	19 4 47	3143	17 37 29	3152	16 10 22	3163
	α Arietis	E.	67 12 42	3084	65 44 13	3082	64 15 42	3080	62 47 8	3076
	Sun	E.	103 15 54	3445	101 54 28	3441	100 32 58	3438	99 11 24	3433
3	Antares	W.	93 1 57	3024	94 31 40	3017	96 1 32	3010	97 31 32	3003
	Jupiter	W.	70 19 51	2999	71 50 5	2993	73 20 27	2985	74 50 59	2977
	α Aquilæ	W.	48 31 3	4511	49 34 45	4439	50 39 31	4372	51 45 18	4307
	α Arietis	E.	55 23 5	3054	53 53 59	3049	52 24 47	3043	50 55 28	3037
	Sun	E.	92 22 8	3404	90 59 56	3396	89 37 35	3388	88 15 5	3380
4	Jupiter	W.	82 26 17	2931	83 57 56	2921	85 29 48	2910	87 1 54	2899
	α Aquilæ	W.	57 27 56	4041	58 38 55	3997	59 50 38	3953	61 3 4	3912
	Mars	W.	24 35 36	3166	26 2 26	3153	27 29 31	3141	28 56 51	3129
	α Arietis	E.	43 26 49	3001	41 56 38	2994	40 26 18	2987	38 55 49	2979
	Sun	E.	81 20 4	3332	79 56 29	3321	78 32 42	3309	77 8 41	3298
5	Jupiter	W.	94 46 5	2838	96 19 43	2825	97 53 38	2812	99 27 50	2798
	α Aquilæ	W.	67 15 6	3732	68 31 19	3701	69 48 5	3670	71 5 24	3640
	Fomalhaut	W.	40 8 47	3621	41 26 59	3563	42 46 14	3508	44 6 29	3457
	Mars	W.	36 17 31	3060	37 46 30	3044	39 15 48	3030	40 45 24	3015
	α Arietis	E.	31 21 2	2944	29 49 39	2939	28 18 9	2935	26 46 34	2931
	Sun	E.	70 5 1	3232	68 39 30	3218	67 13 42	3204	65 47 37	3189
6	Jupiter	W.	107 23 28	2725	108 59 34	2710	110 36 0	2695	112 12 47	2680
	α Aquilæ	W.	77 39 38	3507	78 59 54	3483	80 20 37	3461	81 41 45	3438
	Fomalhaut	W.	51 1 1	3245	52 26 17	3208	53 52 17	3173	55 18 58	3140
	Mars	W.	48 18 12	2935	49 49 46	2918	51 21 42	2901	52 53 59	2885
	α Pegasi	W.	30 1 42	3729	31 17 58	3627	32 36 3	3536	33 55 47	3454
	Saturn	W.	28 26 27	2791	30 1 7	2772	31 36 11	2754	33 11 39	2737
	Sun	E.	58 32 42	3111	57 4 46	3096	55 36 31	3079	54 7 56	3062
7	Fomalhaut	W.	62 41 59	2991	64 12 23	2965	65 43 20	2939	67 14 50	2914
	Mars	W.	60 40 51	2798	62 15 21	2781	63 50 14	2763	65 25 30	2745
	α Pegasi	W.	40 55 3	3143	42 22 21	3093	43 50 39	3048	45 19 52	3006
	Saturn	W.	41 14 54	2647	42 52 45	2630	44 30 59	2612	46 9 37	2595
	Sun	E.	46 39 55	2981	45 9 18	2964	43 38 20	2948	42 7 2	2931
8	Fomalhaut	W.	75 0 0	2799	76 34 29	2779	78 9 25	2759	79 44 47	2740
	Mars	W.	73 27 41	2658	75 5 17	2641	76 43 16	2624	78 21 39	2607
	Saturn	W.	54 28 47	2509	56 9 48	2492	57 51 13	2475	59 33 1	2458
	α Pegasi	W.	52 58 16	2827	54 32 9	2797	56 6 41	2767	57 41 52	2740
	Sun	E.	34 25 33	2858	32 52 20	2844	31 18 49	2831	29 45 2	2821
9	Fomalhaut	W.	87 47 41	2654	89 25 23	2640	91 3 24	2625	92 41 45	2612

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9	Mars	W.	80° 0′ 24″	2591	81° 39′ 32″	2574	83° 19′ 2″	2558	84° 58′ 55″	2543
	Saturn	W.	61 15 13	2442	62 57 48	2426	64 40 45	2411	66 24 4	2395
	α Pegasi	W.	59 17 39	2713	60 54 1	2688	62 30 57	2663	64 8 26	2640
13	Sun	W.	26 9 15	2493	27 50 40	2482	29 32 18	2475	31 14 6	2470
	Spica	E.	93 49 26	2124	91 59 4	2124	90 8 42	2124	88 18 20	2124
14	Sun	W.	39 44 22	2463	41 26 29	2462	43 8 35	2465	44 50 38	2467
	Spica	E.	79 6 52	2134	77 16 45	2137	75 26 43	2141	73 36 47	2146
15	Sun	W.	53 19 37	2490	55 1 4	2496	56 42 23	2503	58 23 32	2510
	Pollux	W.	26 39 36	2204	28 27 58	2207	30 16 15	2211	32 4 26	2216
	Spica	E.	64 28 58	2174	62 39 51	2180	60 50 54	2188	59 2 8	2195
16	Sun	W.	66 46 41	2551	68 26 44	2559	70 6 35	2569	71 46 13	2578
	Pollux	W.	41 3 16	2249	42 50 31	2256	44 37 35	2264	46 24 27	2273
	Spica	E.	50 1 12	2237	48 13 39	2245	46 26 19	2255	44 39 13	2264
	Antares	E.	95 53 56	2233	94 6 18	2242	92 18 53	2251	90 31 42	2260
17	Sun	W.	80 1 0	2629	81 39 15	2640	83 17 16	2651	84 55 2	2661
	Pollux	W.	55 15 30	2319	57 1 2	2328	58 46 20	2339	60 31 23	2348
	Regulus	W.	18 17 7	2309	20 2 53	2319	21 48 25	2329	23 33 42	2339
	Spica	E.	35 47 20	2315	34 1 43	2326	32 16 21	2336	30 31 14	2348
	Antares	E.	81 39 14	2309	79 53 28	2320	78 7 57	2329	76 22 40	2339
	Jupiter	E.	102 43 18	2286	100 56 58	2296	99 10 53	2306	97 25 2	2316
18	Sun	W.	93 0 12	2717	94 36 29	2728	96 12 32	2740	97 48 19	2750
	Pollux	W.	69 13 3	2399	70 56 39	2410	72 40 0	2420	74 23 6	2430
	Regulus	W.	32 16 22	2391	34 0 9	2402	35 43 41	2412	37 26 58	2422
	Antares	E.	67 40 1	2392	65 56 15	2402	64 12 43	2412	62 29 26	2423
	Jupiter	E.	88 39 30	2368	86 55 9	2378	85 11 2	2388	83 27 10	2398
19	Sun	W.	105 43 34	2808	107 17 52	2818	108 51 56	2830	110 25 45	2841
	Pollux	W.	82 54 58	2482	84 36 37	2492	86 18 1	2502	87 59 11	2512
	Regulus	W.	45 59 42	2475	47 41 31	2485	49 23 5	2495	51 4 25	2506
	Antares	E.	53 56 44	2475	52 14 56	2485	50 33 22	2495	48 52 2	2506
	Jupiter	E.	74 51 36	2451	73 9 14	2462	71 27 7	2472	69 45 15	2482
20	Sun	W.	118 11 16	2897	119 43 39	2908	121 15 48	2919	122 47 43	2930
	Regulus	W.	59 27 32	2556	61 7 28	2565	62 47 11	2575	64 26 40	2585
	Antares	E.	40 28 57	2556	38 49 2	2566	37 9 20	2576	35 29 52	2585
	Jupiter	E.	61 19 33	2535	59 39 8	2545	57 58 58	2556	56 19 3	2566
21	Sun	W.	130 23 50	2985	131 54 22	2996	133 24 40	3007	134 54 44	3018
	Regulus	W.	72 40 48	2632	74 18 59	2642	75 56 57	2651	77 34 43	2660
	Spica	W.	18 43 11	2650	20 20 58	2657	21 58 35	2664	23 36 3	2672
	Jupiter	E.	48 3 3	2620	46 24 35	2630	44 46 21	2641	43 8 22	2652
	α Aquilæ	E.	83 3 22	3365	81 40 26	3380	80 17 47	3397	78 55 27	3415
22	Regulus	W.	85 40 31	2704	87 17 5	2713	88 53 27	2722	90 29 37	2731
	Spica	W.	31 40 47	2712	33 17 11	2719	34 53 25	2728	36 29 28	2737
	Jupiter	E.	35 2 19	2712	33 25 55	2725	31 49 49	2740	30 14 2	2754
	α Aquilæ	E.	72 9 8	3519	70 49 5	3544	69 29 29	3570	68 10 22	3598

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9	Mars	W.	86° 39′ 9″	2527	88° 19′ 45″	2512	90° 0′ 42″	2497	91° 42′ 0″	2482
	Saturn	W.	68 7 46	2380	69 51 50	2365	71 36 15	2350	73 21 1	2336
	α Pegasi	W.	65 46 26	2618	67 24 56	2596	69 3 54	2577	70 43 20	2558
13	Sun	W.	32 56 1	2466	34 38 2	2463	36 20 7	2462	38 2 14	2461
	Spica	E.	86 27 58	2126	84 37 37	2127	82 47 19	2129	80 57 4	2131
14	Sun	W.	46 32 37	2471	48 14 31	2475	49 56 20	2480	51 38 2	2485
	Spica	E.	71 46 57	2151	69 57 15	2156	68 7 41	2161	66 18 15	2167
15	Sun	W.	60 4 32	2517	61 45 21	2526	63 25 59	2533	65 6 26	2542
	Pollux	W.	33 52 30	2221	35 40 26	2227	37 28 13	2234	39 15 50	2241
	Spica	E.	57 13 33	2203	55 25 10	2210	53 36 58	2219	51 48 59	2227
16	Sun	W.	73 25 38	2588	75 4 49	2598	76 43 47	2608	78 22 31	2619
	Pollux	W.	48 11 6	2282	49 57 32	2291	51 43 45	2300	53 29 44	2309
	Spica	E.	42 52 21	2274	41 5 44	2284	39 19 21	2294	37 33 13	2304
	Antares	E.	88 44 44	2270	86 58 0	2279	85 11 30	2289	83 25 15	2299
17	Sun	W.	86 32 34	2673	88 9 51	2684	89 46 53	2695	91 23 40	2706
	Pollux	W.	62 16 12	2358	64 0 47	2368	65 45 7	2379	67 29 12	2389
	Regulus	W.	25 18 44	2350	27 3 31	2360	28 48 3	2371	30 32 20	2381
	Spica	E.	28 46 24	2359	27 1 50	2371	25 17 33	2382	23 33 33	2394
	Antares	E.	74 37 38	2350	72 52 51	2360	71 8 19	2371	69 24 2	2382
	Jupiter	E.	95 39 26	2326	93 54 5	2336	92 8 58	2346	90 24 6	3357
18	Sun	W.	99 23 52	2762	100 59 10	2773	102 34 13	2785	104 9 1	2796
	Pollux	W.	76 5 58	2441	77 48 35	2451	79 30 57	2461	81 13 5	2472
	Regulus	W.	39 10 1	2433	40 52 48	2443	42 35 21	2454	44 17 39	2465
	Antares	E.	60 46 24	2433	59 3 37	2444	57 21 5	2454	55 38 47	2465
	Jupiter	E.	81 43 33	2409	80 0 11	2420	78 17 5	2430	76 34 13	2441
19	Sun	W.	111 59 20	2652	113 32 41	2663	115 5 47	2674	116 38 39	2686
	Pollux	W.	89 40 7	2522	91 20 49	2533	93 1 17	2543	94 41 31	2553
	Regulus	W.	52 45 30	2515	54 26 22	2526	56 6 59	2536	57 47 22	2545
	Antares	E.	47 10 57	2516	45 30 6	2526	43 49 29	2536	42 9 6	2546
	Jupiter	E.	68 3 37	2493	66 22 14	2504	64 41 6	2514	63 0 12	2525
20	Sun	W.	124 19 24	2941	125 50 51	2952	127 22 4	2962	128 53 4	2973
	Regulus	W.	66 5 56	2594	67 44 59	2604	69 23 48	2614	71 2 24	2623
	Antares	E.	33 50 37	2595	32 11 35	2605	30 32 47	2614	28 54 11	2624
	Jupiter	E.	54 39 22	2577	52 59 55	2588	51 20 43	2599	49 41 46	2609
21	Sun	W.	136 24 34	3020	137 54 11	3041	139 23 33	3059	140 52 41	3084
	Regulus	W.	79 12 17	2669	80 49 39	2678	82 26 48	2687	84 3 45	2695
	Spica	W.	25 13 21	2679	26 50 29	2687	28 27 26	2695	30 4 12	2704
	Jupiter	E.	41 30 38	2664	39 53 10	2675	38 15 57	2687	36 39 0	2699
	α Aquilæ	E.	77 33 27	3433	76 11 48	3453	74 50 31	3473	73 29 37	3496
22	Regulus	W.	92 5 36	2740	93 41 23	2748	95 16 59	2756	96 52 24	2766
	Spica	W.	38 5 19	2745	39 40 59	2753	41 16 29	2761	42 51 48	2769
	Jupiter	E.	28 38 34	2770	27 3 27	2787	25 28 42	2806	23 54 21	2827
	α Aquilæ	E.	66 51 46	3626	65 33 42	3659	64 16 11	3693	62 59 16	3728

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23	Spica	W.	44° 26′ 56″	2778	46° 1′ 53″	2786	47° 36′ 40″	2794	49° 11′ 16″	2802
	α Aquilæ	E.	61 42 59	3766	60 27 21	3806	59 12 25	3849	57 58 13	3894
	Mars	E.	91 0 44	2938	89 29 13	2946	87 57 52	2954	86 26 42	2962
	Saturn	E.	103 29 6	2786	101 54 20	2795	100 19 45	2803	98 45 21	2811
24	Spica	W.	57 1 36	2842	58 35 9	2850	60 8 32	2859	61 41 44	2866
	α Aquilæ	E.	51 59 46	4176	50 50 57	4245	49 43 13	4320	48 36 39	4400
	Fomalhaut	E.	72 20 1	3171	70 53 17	3186	69 26 51	3200	68 0 42	3216
	Mars	E.	78 53 29	3006	77 23 22	3013	75 53 25	3021	74 23 38	3030
	Saturn	E.	90 55 56	2851	89 22 34	2859	87 49 23	2867	86 16 22	2875
	α Pegasi	E.	94 2 8	3052	92 32 59	3060	91 4 0	3067	89 35 10	3075
25	Spica	W.	69 25 19	2904	70 57 33	2912	72 29 37	2919	74 1 32	2926
	Antares	W.	23 30 59	2902	25 3 15	2910	26 35 21	2917	28 7 18	2925
	Fomalhaut	E.	60 54 51	3306	59 30 45	3326	58 7 3	3347	56 43 46	3370
	Mars	E.	66 57 17	3070	65 28 31	3078	63 59 54	3086	62 31 27	3094
	Saturn	E.	78 33 46	2913	77 1 44	2921	75 29 52	2928	73 58 9	2935
	α Pegasi	E.	82 13 31	3118	80 45 43	3127	79 18 6	3137	77 50 41	3147
26	Spica	W.	81 38 51	2961	83 9 53	2968	84 40 46	2974	86 11 31	2981
	Antares	W.	35 44 46	2959	37 15 50	2966	38 46 45	2973	40 17 38	2979
	Jupiter	W.	16 29 37	3102	17 57 44	3079	19 26 19	3064	20 55 13	3052
	Fomalhaut	E.	49 54 22	3506	48 34 5	3539	47 14 24	3575	45 55 22	3613
	Mars	E.	55 11 36	3133	53 44 6	3140	52 16 45	3148	50 49 33	3155
	Saturn	E.	66 21 52	2972	64 51 4	2978	63 20 24	2985	61 49 53	2992
	α Pegasi	E.	70 36 40	3200	69 10 31	3211	67 44 35	3223	66 18 53	3236
27	Antares	W.	47 49 31	3009	49 19 23	3014	50 49 29	3019	52 19 18	3025
	Jupiter	W.	28 22 7	3039	29 51 42	3033	31 21 17	3030	32 50 52	3031
	Fomalhaut	E.	39 31 42	3860	38 17 42	3924	37 4 47	3996	35 53 3	4074
	Mars	E.	43 35 48	3193	42 9 30	3199	40 43 20	3207	39 17 19	3214
	Saturn	E.	54 19 18	3023	52 49 34	3030	51 19 58	3035	49 50 29	3040
	α Pegasi	E.	59 14 11	3306	57 50 3	3319	56 26 13	3334	55 2 41	3351
28	Antares	W.	59 46 52	3047	61 16 7	3051	62 45 17	3054	64 14 23	3057
	Jupiter	W.	40 18 27	3038	41 47 53	3040	43 17 16	3041	44 46 38	3043
	Mars	E.	32 9 30	3254	30 44 25	3263	29 19 30	3272	27 54 46	3282
	Saturn	E.	42 24 43	3067	40 55 53	3072	39 27 9	3077	37 58 31	3081
	α Pegasi	E.	48 10 12	3451	46 48 53	3476	45 28 1	3501	44 7 38	3528
	α Arietis	E.	88 26 36	3066	86 57 45	3069	85 28 58	3073	84 0 16	3076
29	Antares	W.	71 39 1	3069	73 7 48	3070	74 36 34	3072	76 5 18	3072
	Jupiter	W.	52 13 1	3048	53 42 14	3049	55 11 26	3049	56 40 38	3050
	Saturn	E.	30 36 44	3104	29 8 39	3109	27 40 40	3114	26 12 47	3119
	α Pegasi	E.	37 34 11	3700	36 17 33	3758	35 1 47	3812	33 46 57	3871
	α Arietis	E.	76 37 38	3089	75 9 15	3091	73 40 54	3092	72 12 35	3094
	Sun	E.	138 1 0	3461	136 39 52	3461	135 18 44	3461	133 57 36	3461
30	Antares	W.	83 28 55	3071	84 57 40	3070	86 26 26	3068	87 55 15	3066
	Jupiter	W.	64 6 41	3046	65 35 57	3043	67 5 16	3042	68 34 37	3039
	α Aquilæ	W.	42 2 6	6144	42 57 10	5087	43 53 44	4990	44 51 43	4881
	α Arietis	E.	64 51 15	3095	63 22 59	3094	61 54 42	3092	60 26 23	3091
	Sun	E.	127 11 46	3454	125 50 31	3453	124 29 14	3450	123 7 54	3447

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23	Spica	W.	50° 45′ 41″	2811	52° 19′ 55″	2818	53° 53′ 59″	2826	55° 27′ 53″	2835
	α Aquilæ	E.	56 44 47	3942	55 32 10	3996	54 20 26	4051	53 9 37	4111
	Mars	E.	84 55 42	2971	83 24 53	2980	81 54 15	2988	80 23 47	2996
	Saturn	E.	97 11 7	2819	95 37 4	2827	94 3 11	2835	92 29 28	2843
24	Spica	W.	63 14 47	2873	64 47 40	2881	66 20 23	2889	67 52 56	2897
	α Aquilæ	E.	47 31 18	4488	46 27 15	4584	45 24 36	4686	44 23 25	4798
	Fomalhaut	E.	66 34 52	3232	65 9 21	3249	63 44 10	3267	62 19 20	3285
	Mars	E.	72 54 2	3037	71 24 35	3046	69 55 19	3054	68 26 13	3062
	Saturn	E.	84 43 31	2883	83 10 50	2891	81 38 19	2898	80 5 58	2905
	α Pegasi	E.	88 6 30	3083	86 38 0	3091	85 9 40	3100	83 41 30	3109
25	Spica	W.	75 33 18	2933	77 4 55	2941	78 36 22	2947	80 7 41	2954
	Antares	W.	29 39 5	2932	31 10 43	2939	32 42 13	2946	34 13 34	2953
	Fomalhaut	E.	55 20 55	3394	53 58 32	3419	52 36 37	3446	51 15 13	3476
	Mars	E.	61 3 10	3101	59 35 2	3110	58 7 4	3117	56 39 15	3125
	Saturn	E.	72 26 35	2942	70 55 10	2950	69 23 55	2958	67 52 49	2965
	α Pegasi	E.	76 23 28	3157	74 56 27	3167	73 29 38	3178	72 3 2	3189
26	Spica	W.	87 42 8	2987	89 12 37	2993	90 42 59	2999	92 13 13	3005
	Antares	W.	41 48 11	2985	43 18 42	2991	44 49 6	2997	46 19 22	3003
	Jupiter	W.	22 24 21	3044	23 53 39	3039	25 23 4	3034	26 52 34	3032
	Fomalhaut	E.	44 37 2	3655	43 19 27	3699	42 2 39	3748	40 46 43	3801
	Mars	E.	49 22 30	3163	47 55 36	3170	46 28 51	3178	45 2 15	3185
	Saturn	E.	60 19 30	2998	58 49 15	3005	57 19 8	3011	55 49 9	3018
	α Pegasi	E.	64 53 26	3248	63 28 14	3261	62 3 17	3275	60 38 36	3288
27	Antares	W.	53 49 0	3030	55 18 36	3034	56 48 7	3039	58 17 32	3043
	Jupiter	W	34 20 26	3032	35 49 59	3034	37 19 30	3035	38 48 59	3036
	Fomalhaut	E.	34 42 36	4162	33 33 34	4262	32 26 6	4373	31 20 20	4497
	Mars	E.	37 51 27	3222	36 25 44	3230	35 0 10	3237	33 34 45	3246
	Saturn	E.	48 21 6	3047	46 51 51	3052	45 22 42	3056	43 53 39	3062
	α Pegasi	E.	53 39 29	3368	52 16 36	3387	50 54 5	3407	49 31 56	3429
28	Antares	W.	65 43 25	3060	67 12 24	3063	68 41 19	3065	70 10 11	3067
	Jupiter	W.	46 15 58	3044	47 45 16	3046	49 14 32	3047	50 43 47	3047
	Mars	E.	26 30 13	3293	25 5 53	3306	23 41 48	3319	22 17 58	3334
	Saturn	E.	36 29 58	3086	35 1 31	3091	33 33 10	3095	32 4 54	3100
	α Pegasi	E.	42 47 45	3558	41 28 25	3591	40 9 41	3626	38 51 35	3665
	α Arietis	E.	82 31 37	3079	81 3 2	3082	79 34 31	3085	78 6 3	3087
29	Antares	W.	77 34 2	3073	79 2 45	3073	80 31 28	3073	82 0 11	3072
	Jupiter	W.	58 9 49	3049	59 39 1	3049	61 8 13	3048	62 37 26	3047
	Saturn	E.	24 45 0	3124	23 17 20	3132	21 49 49	3139	20 22 27	3149
	α Pegasi	E.	32 33 8	3939	31 20 28	4018	30 9 6	4106	28 59 10	4206
	α Arietis	E.	70 44 18	3095	69 16 2	3095	67 47 46	3096	66 19 31	3095
	Sun	E.	132 36 28	3460	131 15 19	3460	129 54 10	3468	128 32 59	3456
30	Antares	W.	89 24 6	3064	90 53 0	3060	92 21 58	3057	93 51 0	3053
	Jupiter	W.	70 4 1	3037	71 33 28	3033	73 3 0	3030	74 32 36	3026
	α Aquilæ	W.	45 51 2	4730	46 51 36	4648	47 53 20	4570	48 56 11	4499
	α Arietis	E.	58 58 3	3090	57 29 41	3088	56 1 17	3086	54 32 50	3082
	Sun	E.	121 46 31	3444	120 25 4	3440	119 3 33	3436	117 41 57	3432

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	THE SUN'S Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be added to Apparent Time.*	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sun.	1	6 42 8.29	10.335	N.23 6 13.8	-10.40	15 46.13	68.77	3 33.38	0.478
Mon.	2	6 46 16.23	10.324	23 1 52.1	11.41	15 46.12	68.73	3 44.73	0.467
Tues.	3	6 50 23.92	10.313	22 57 6.2	12.41	15 46.12	68.69	3 55.82	0.456
Wed.	4	6 54 31.31	10.301	22 51 56.3	13.41	15 46.12	68.65	4 6.63	0.444
Thur.	5	6 58 38.40	10.289	22 46 22.4	14.40	15 46.13	68.60	4 17.13	0.432
Frid.	6	7 2 45.18	10.275	22 40 24.7	15.39	15 46.14	68.55	4 27.32	0.418
Sat.	7	7 6 51.62	10.261	22 34 3.4	16.37	15 46.15	68.50	4 37.18	0.404
Sun.	8	7 10 57.70	10.245	22 27 18.6	17.35	15 46.17	68.45	4 46.68	0.388
Mon.	9	7 15 3.38	10.228	22 20 10.4	18.32	15 46.19	68.39	4 55.77	0.371
Tues.	10	7 19 8.64	10.210	22 12 39.1	19.28	15 46.22	68.33	5 4.45	0.353
Wed.	11	7 23 13.48	10.192	22 4 44.8	20.23	15 46.26	68.27	5 12.70	0.335
Thur.	12	7 27 17.86	10.173	21 56 27.6	21.17	15 46.31	68.21	5 20.50	0.316
Frid.	13	7 31 21.76	10.153	21 47 47.9	22.11	15 46.36	68.14	5 27.82	0.296
Sat.	14	7 35 25.17	10.132	21 38 45.9	23.04	15 46.41	68.07	5 34.66	0.275
Sun.	15	7 39 28.09	10.111	21 29 21.8	23.96	15 46.47	68.00	5 41.01	0.254
Mon.	16	7 43 30.49	10.089	21 19 35.6	24.86	15 46.54	67.93	5 46.84	0.232
Tues.	17	7 47 32.35	10.067	21 9 27.8	25.76	15 46.61	67.85	5 52.13	0.210
Wed.	18	7 51 33.67	10.043	20 58 58.7	26.65	15 46.68	67.78	5 56.87	0.187
Thur.	19	7 55 34.42	10.019	20 48 8.3	27.53	15 46.76	67.70	6 1.05	0.163
Frid.	20	7 59 34.60	9.995	20 36 57.0	28.40	15 46.84	67.62	6 4.66	0.139
Sat.	21	8 3 34.21	9.971	20 25 25.0	29.26	15 46.92	67.54	6 7.70	0.115
Sun.	22	8 7 33.24	9.947	20 13 32.4	30.11	15 47.01	67.46	6 10.17	0.091
Mon.	23	8 11 31.68	9.923	20 1 19.7	30.95	15 47.10	67.38	6 12.05	0.067
Tues.	24	8 15 29.53	9.899	19 48 46.8	31.78	15 47.19	67.30	6 13.34	0.043
Wed.	25	8 19 26.80	9.874	19 35 54.2	32.60	15 47.29	67.22	6 14.04	0.018
Thur.	26	8 23 23.47	9.850	19 22 42.1	33.40	15 47.39	67.14	6 14.15	0.006
Frid.	27	8 27 19.54	9.825	19 9 10.7	34.20	15 47.50	67.05	6 13.66	0.031
Sat.	28	8 31 15.02	9.801	18 55 20.5	34.98	15 47.61	66.97	6 12.59	0.055
Sun.	29	8 35 9.92	9.776	18 41 11.5	35.76	15 47.72	66.88	6 10.94	0.080
Mon.	30	8 39 4.23	9.751	18 26 44.1	36.52	15 47.83	66.80	6 8.70	0.105
Tues.	31	8 42 57.95	9.727	18 11 58.5	37.27	15 47.95	66.71	6 5.87	0.129
Wed.	32	8 46 51.08	9.702	N.17 56 54.9	-38.01	15 48.07	66.63	6 2.44	0.154

Note.—Mean Time of the Semidiameter passing may be found by subtracting $0^s.19$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Equation of Time, *to be subtracted from Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sun.	1	6 42 7.69	10.334	N.23 6 14.4	-10.40	3 33.35	0.478	6 38 34.34
Mon.	2	6 46 15.60	10.323	23 1 52.8	11.41	3 44.70	0.467	6 42 30.90
Tues.	3	6 50 23.25	10.312	22 57 7.0	12.41	3 55.79	0.456	6 46 27.46
Wed.	4	6 54 30.62	10.300	22 51 57.2	13.41	4 6.60	0.444	6 50 24.02
Thur.	5	6 58 37.68	10.288	22 46 23.4	14.40	4 17.10	0.432	6 54 20.58
Frid.	6	7 2 44.43	10.274	22 40 25.9	15.39	4 27.29	0.418	6 58 17.14
Sat.	7	7 6 50.84	10.260	22 34 4.7	16.37	4 37.15	0.404	7 2 13.69
Sun.	8	7 10 56 90	10.244	22 27 20.0	17.35	4 46.65	0.388	7 6 10.25
Mon.	9	7 15 2.55	10.227	22 20 11.9	18.32	4 55.74	0.371	7 10 6.81
Tues.	10	7 19 7.79	10.209	22 12 40.7	19.28	5 4.42	0.353	7 14 3.37
Wed.	11	7 23 12.60	10.191	22 4 46.5	20.23	5 12.67	0.335	7 17 59.93
Thur.	12	7 27 16.96	10.172	21 56 29.5	21.17	5 20.47	0.316	7 21 56.49
Frid.	13	7 31 20.84	10.152	21 47 49.9	22.11	5 27.79	0.296	7 25 53.05
Sat.	14	7 35 24.24	10.131	21 38 48.0	23.04	5 34.63	0.275	7 29 49.61
Sun.	15	7 39 27.14	10.110	21 29 24.0	23.96	5 40.98	0.254	7 33 46.16
Mon.	16	7 43 29.53	10.088	21 19 38.0	24.86	5 46.81	0.232	7 37 42.72
Tues.	17	7 47 31.38	10.066	21 9 30.3	25.76	5 52.11	0.210	7 41 39.27
Wed.	18	7 51 32 68	10.043	20 59 1.3	26.65	5 56.85	0.187	7 45 35.83
Thur.	19	7 55 33.42	10.019	20 48 11.0	27.53	6 1.03	0.163	7 49 32.39
Frid.	20	7 59 33.59	9.995	20 36 59.8	28.40	6 4.64	0.139	7 53 28.95
Sat.	21	8 3 33.19	9.971	20 25 27.9	29.26	6 7.69	0.115	7 57 25.50
Sun.	22	8 7 32.21	9.947	20 13 35.4	30.11	6 10.15	0.091	8 1 22.06
Mon.	23	8 11 30.65	9.923	20 1 22.8	30.95	6 12.03	0.067	8 5 18.62
Tues.	24	8 15 28.50	9.899	19 48 50.1	31.78	6 13.32	0.043	8 9 15.18
Wed.	25	8 19 25.77	9.874	19 35 57.6	32.60	6 14.04	0.018	8 13 11.73
Thur.	26	8 23 22.44	9.850	19 22 45.5	33.40	6 14 15	0.006	8 17 8.29
Frid.	27	8 27 18.51	9.825	19 9 14.3	34.20	6 15.66	0.031	8 21 4.85
Sat.	28	8 31 14.00	9.801	18 55 24.1	34.98	6 12.59	0.055	8 25 1.41
Sun.	29	8 35 8.91	9.776	18 41 15.2	35.76	6 10.95	0.080	8 28 57.96
Mon.	30	8 39 3.23	9.751	18 26 47.8	36.52	6 8.71	0.105	8 32 54.52
Tues.	31	8 42 56.96	9.727	18 12 2.2	37.27	6 5.88	0.129	8 36 51.08
Wed.	32	8 46 50.10	9.702	N.17 56 58.7	-38.01	6 2.46	0.154	8 40 47.64

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^{s}.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	THE SUN'S *True* LONGITUDE. λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	182	99 41 3.8	40 31.0	142.97	+0.33	0.0072216	+ 2.1	17 18 35.05
2	183	100 38 15.1	37 42.1	142.98	0.45	.0072257	1.3	17 14 39.13
3	184	101 35 26.7	34 53.5	142.99	0.58	.0072278	+ 0.5	17 10 43.22
4	185	102 32 38.7	32 5.3	143.00	0.68	.0072279	− 0.4	17 6 47.31
5	186	103 29 51.0	29 17.4	143.01	0.75	.0072258	1.4	17 2 51.39
6	187	104 27 3.6	26 29.8	143.02	0.77	.0072214	2.3	16 58 55.48
7	188	105 24 16.6	23 42.6	143.04	0.78	.0072147	3.3	16 54 59.57
8	189	106 21 29.8	20 55.7	143.05	0.74	.0072055	4.3	16 51 3.66
9	190	107 18 43.4	18 9.1	143.07	0.70	.0071937	5.4	16 47 7.75
10	191	108 15 57.3	15 22.8	143.08	0.61	.0071793	6.5	16 43 11.83
11	192	109 13 11.5	12 36.8	143.10	0.52	.0071622	7.7	16 39 15.91
12	193	110 10 25.9	9 51.0	143.10	0.40	.0071424	8.8	16 35 20.00
13	194	111 7 40.5	7 5.4	143.11	0.27	.0071200	9.8	16 31 24.09
14	195	112 4 55.3	4 20.1	143.12	0.14	.0070951	10.9	16 27 28.18
15	196	113 2 10.3	1 34.9	143.13	+0.01	.0070677	11.9	16 23 32.27
16	197	113 59 25.5	58 49.9	143.14	−0.12	.0070380	12.8	16 19 36.36
17	198	114 56 40.9	56 5.1	143.15	0.22	.0070061	13.7	16 15 40.45
18	199	115 53 56.4	53 20.5	143.15	0.31	.0069722	14.6	16 11 44.53
19	200	116 51 12.2	50 36.1	143.16	0.38	.0069364	15.3	16 7 48.62
20	201	117 48 28.2	47 51.9	143.17	0.41	.0068988	16.0	16 3 52.71
21	202	118 45 44.5	45 8.0	143.19	0.41	.0068596	16.7	15 59 56.80
22	203	119 43 1.2	42 24.5	143.21	0.37	.0068189	17.4	15 56 0.89
23	204	120 40 18.5	39 41.6	143.23	0.32	.0067766	18.0	15 52 4.97
24	205	121 37 36.3	36 59.3	143.25	0.22	.0067328	18.6	15 48 9.06
25	206	122 34 54.8	34 17.6	143.28	0.13	.0066875	19.1	15 44 13.15
26	207	123 32 14.0	31 36.6	143.31	−0.01	.0066409	19.6	15 40 17.24
27	208	124 29 33.9	28 56.3	143.34	+0.11	.0065931	20.1	15 36 21.33
28	209	125 26 54.6	26 16.9	143.38	0.24	.0065441	20.7	15 32 25.42
29	210	126 24 16.3	23 38.5	143.42	0.37	.0064937	21.3	15 28 29.51
30	211	127 21 39.1	21 1.1	143.47	0.48	.0064418	21.9	15 24 33.59
31	212	128 19 3.0	18 24.8	143.52	0.58	.0063883	22.6	15 20 37.68
32	213	129 16 28.2	15 49.8	143.57	+0.65	0.0063332	−23.3	15 16 41.77

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^{s}.8296$

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 49.6	14 52.0	54 18.2	+0.63	54 27.0	+0.83	16 45.3	1.64	19.9
2	14 55.1	14 58.8	54 38.1	1.03	54 51.7	1.23	17 25.0	1.68	20.9
3	15 3.1	15 8.0	55 7.6	1.43	55 25.9	1.61	18 6.3	1.77	21.9
4	15 13.6	15 19.7	55 46.3	1.79	56 8.8	1.95	18 50.4	1.92	22.9
5	15 26.4	15 33.4	56 33.1	2.07	56 58.9	2.21	19 38.7	2.13	23.9
6	15 40.7	15 48.3	57 25.9	2.29	57 53.6	2.32	20 32.4	2.36	24.9
7	15 55.9	16 3.4	58 21.5	2.32	58 49.0	2.25	21 31.7	2.58	25.9
8	16 10.5	16 17.3	59 15.4	2.14	59 40.1	1.97	22 35.3	2.71	26.9
9	16 23.4	16 28.6	60 2.5	1.75	60 21.8	1.47	23 40.5	2.70	27.9
10	16 33.0	16 36.2	60 37.6	1.16	60 49.4	0.81	6		28.9
11	16 38.2	16 39.0	60 56.9	+0.44	60 59.9	+0.07	0 44.1	2.57	0.6
12	16 38.6	16 37.0	60 58.5	−0.30	60 52.7	−0.66	1 43.6	2.38	1.6
13	16 34.4	16 30.7	60 42.9	0.98	60 29.4	1.26	2 38.6	2.20	2.6
14	16 26.2	16 21.0	60 12.8	1.50	59 53.7	1.68	3 29.7	2.07	3.6
15	16 15.2	16 9.1	59 32.6	1.82	59 10.1	1.92	4 18.3	1.99	4.6
16	16 2.8	15 56.3	58 46.8	1.96	58 23.2	1.97	5 5.8	1.98	5.6
17	15 49.9	15 43.6	57 59.6	1.95	57 36.5	1.90	5 53.6	2.01	6.6
18	15 37.5	15 31.7	57 14.2	1.82	56 52.8	1.74	6 42.7	2.09	7.6
19	15 26.2	15 21.0	56 32.5	1.64	56 13.4	1.54	7 33.7	2.17	8.6
20	15 16.2	15 11.6	55 55.6	1.43	55 39.0	1.33	8 26.5	2.23	9.6
21	15 7.5	15 3.7	55 23.8	1.21	55 9.9	1.10	9 20.4	2.25	10.6
22	15 0.3	14 57.2	54 57.3	0.99	54 46.0	0.89	10 13.9	2.20	11.6
23	14 54.5	14 52.1	54 36.0	0.78	54 27.2	0.69	11 5.7	2.10	12.6
24	14 50.0	14 48.3	54 19.5	0.59	54 13.1	0.48	11 54.7	1.98	13.6
25	14 46.9	14 45.7	54 7.9	0.38	54 3.9	0.28	12 40.6	1.85	14.6
26	14 45.0	14 44.6	54 1.2	−0.17	53 59.8	−0.06	13 23.6	1.74	15.6
27	14 44.7	14 45.1	53 59.9	+0.08	54 1.6	+0.20	14 4.5	1.66	16.6
28	14 46.0	14 47.4	54 4.8	0.34	54 9.9	0.50	14 44.0	1.63	17.6
29	14 49.3	14 51.7	54 16.8	0.66	54 25.7	0.82	15 23.2	1.64	18.6
30	14 54.6	14 58.2	54 36.6	0.99	54 49.6	1.17	16 3.2	1.70	19.6
31	15 2.3	15 7.0	55 4.7	1.35	55 22.0	1.53	16 45.3	1.81	20.6
32	15 12.3	15 18.0	55 41.3	+1.70	56 2.7	+1.86	17 30.6	1.98	21.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	22 57 8.04	1.7647	S. 5 41 7.8	13.763
1	22 58 53.89	1.7639	5 27 21.3	13.787
2	23 0 39.70	1.7632	5 13 33.4	13.810
3	23 2 25.47	1.7625	4 59 44.1	13.833
4	23 4 11.20	1.7619	4 45 53.4	13.856
5	23 5 56.90	1.7613	4 32 1.4	13.877
6	23 7 42.56	1.7608	4 18 8.2	13.898
7	23 9 28.20	1.7605	4 4 13.7	13.918
8	23 11 13.82	1.7603	3 50 18.0	13.938
9	23 12 59.43	1.7601	3 36 21.2	13.957
10	23 14 45.03	1.7599	3 22 23.2	13.975
11	23 16 30.62	1.7598	3 8 24.2	13.993
12	23 18 16.21	1.7599	2 54 24.1	14.010
13	23 20 1.81	1.7600	2 40 23.0	14.026
14	23 21 47.41	1.7601	2 26 21.0	14.042
15	23 23 33.02	1.7604	2 12 18.0	14.057
16	23 25 18.65	1.7608	1 58 14.1	14.072
17	23 27 4.31	1.7612	1 44 9.4	14.085
18	23 28 49.99	1.7616	1 30 3.9	14.097
19	23 30 35.70	1.7622	1 15 57.7	14.110
20	23 32 21.45	1.7628	1 1 50.7	14.122
21	23 34 7.24	1.7636	0 47 43.0	14.133
22	23 35 53.08	1.7644	0 33 34.7	14.143
23	23 37 38.97	1.7652	S. 0 19 25.8	14.153

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 39 24.91	1.7662	S. 0 5 16.3	14.162
1	23 41 10.91	1.7672	N. 0 8 53.7	14.171
2	23 42 56.98	1.7684	0 23 4.2	14.178
3	23 44 43.12	1.7696	0 37 15.1	14.185
4	23 46 29.33	1.7708	0 51 26.4	14.191
5	23 48 15.62	1.7722	1 5 38.0	14.197
6	23 50 2.00	1.7737	1 19 50.0	14.202
7	23 51 48.47	1.7752	1 34 2.2	14.206
8	23 53 35.03	1.7768	1 48 14.7	14.210
9	23 55 21.69	1.7785	2 2 27.4	14.212
10	23 57 8.45	1.7803	2 16 40.2	14.214
11	23 58 55.33	1.7822	2 30 53.1	14.215
12	0 0 42.32	1.7842	2 45 6.0	14.216
13	0 2 29.43	1.7862	2 59 19.0	14.216
14	0 4 16.66	1.7883	3 13 31.9	14.215
15	0 6 4.02	1.7905	3 27 44.8	14.214
16	0 7 51.52	1.7927	3 41 57.6	14.212
17	0 9 39.15	1.7951	3 56 10.2	14.208
18	0 11 26.93	1.7976	4 10 22.6	14.204
19	0 13 14.86	1.8001	4 24 34.7	14.200
20	0 15 2.94	1.8028	4 38 46.6	14.195
21	0 16 51.19	1.8055	4 52 58.1	14.188
22	0 18 39.60	1.8082	5 7 9.2	14.182
23	0 20 28.17	1.8110	5 21 19.9	14.174
24	0 22 16.92	1.8140	N. 5 35 30.1	14.165

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 22 16.92	1.8140	N. 5 35 30.1	14.165
1	0 24 5.85	1.8170	5 49 39.7	14.156
2	0 25 54.96	1.8202	6 3 48.8	14.147
3	0 27 44.27	1.8235	6 17 57.3	14.136
4	0 29 33.78	1.8268	6 32 5.1	14.123
5	0 31 23.48	1.8301	6 46 12.1	14.111
6	0 33 13.39	1.8336	7 0 18.4	14.098
7	0 35 3.51	1.8372	7 14 23.9	14.084
8	0 36 53.85	1.8408	7 28 28.5	14.068
9	0 38 44.41	1.8446	7 42 32.1	14.052
10	0 40 35.20	1.8484	7 56 34.7	14.035
11	0 42 26.22	1.8523	8 10 36.3	14.018
12	0 44 17.47	1.8563	8 24 36.9	14.001
13	0 46 8.97	1.8604	8 38 36.4	13.981
14	0 48 0.72	1.8646	8 52 31.6	13.959
15	0 49 52.72	1.8688	9 6 31.5	13.937
16	0 51 44.98	1.8732	9 20 27.1	13.916
17	0 53 37.50	1.8776	9 34 21.4	13.893
18	0 55 30.29	1.8822	9 48 14.3	13.869
19	0 57 23.36	1.8868	10 2 5.7	13.843
20	0 59 16.70	1.8914	10 15 55.5	13.818
21	1 1 10.33	1.8962	10 29 43.8	13.792
22	1 3 4.25	1.9011	10 43 30.5	13.763
23	1 4 58.46	1.9061	N. 10 57 15.4	13.733

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 6 52.98	1.9112	N. 11 10 58.5	13.703
1	1 8 47.81	1.9163	11 24 39.8	13.672
2	1 10 42.94	1.9215	11 38 19.2	13.641
3	1 12 38.39	1.9268	11 51 56.7	13.608
4	1 14 34.16	1.9322	12 5 32.1	13.573
5	1 16 30.26	1.9377	12 19 5.4	13.538
6	1 18 26.69	1.9433	12 32 36.6	13.502
7	1 20 23.46	1.9490	12 46 5.6	13.464
8	1 22 20.57	1.9548	12 59 32.3	13.425
9	1 24 18.03	1.9606	13 12 56.6	13.385
10	1 26 15.84	1.9665	13 26 18.5	13.344
11	1 28 14.01	1.9725	13 39 37.9	13.302
12	1 30 12.54	1.9786	13 52 54.7	13.258
13	1 32 11.44	1.9848	14 6 8.9	13.214
14	1 34 10.71	1.9910	14 19 20.4	13.168
15	1 36 10.36	1.9973	14 32 29.1	13.121
16	1 38 10.39	2.0037	14 45 34.9	13.073
17	1 40 10.81	2.0103	14 58 37.9	13.025
18	1 42 11.63	2.0169	15 11 37.9	12.974
19	1 44 12.84	2.0236	15 24 34.8	12.922
20	1 46 14.46	2.0304	15 37 28.5	12.868
21	1 48 16.49	2.0372	15 50 18.9	12.813
22	1 50 18.93	2.0441	16 3 6.0	12.758
23	1 52 21.78	2.0611	16 15 49.8	12.701
24	1 54 25.06	2.0582	N. 16 28 30.1	12.643

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 54 25.06	2.0582	N.16 28 30.1	12.643
1	1 56 28.77	2.0654	16 41 6.8	12.582
2	1 58 32.91	2.0726	16 53 39.9	12.521
3	2 0 37.48	2.0798	17 6 9.3	12.458
4	2 2 42.49	2.0872	17 18 34.8	12.393
5	2 4 47.95	2.0947	17 30 56.4	12.327
6	2 6 53.86	2.1022	17 43 14.0	12.260
7	2 9 0.22	2.1098	17 55 27.6	12.192
8	2 11 7.04	2.1176	18 7 37.0	12.122
9	2 13 14.33	2.1254	18 19 42.2	12.050
10	2 15 22.09	2.1332	18 31 43.0	11.977
11	2 17 30.31	2.1410	18 43 39.4	11.902
12	2 19 39.01	2.1490	18 55 31.3	11.827
13	2 21 48.19	2.1570	19 7 18.6	11.749
14	2 23 57.85	2.1650	19 19 1.2	11.669
15	2 26 7.99	2.1731	19 30 38.9	11.588
16	2 28 18.62	2.1813	19 42 11.7	11.506
17	2 30 29.75	2.1896	19 53 39.6	11.422
18	2 32 41.37	2.1978	20 5 2.4	11.337
19	2 34 53.49	2.2062	20 16 20.0	11.249
20	2 37 6.12	2.2147	20 27 32.3	11.159
21	2 39 19.25	2.2231	20 38 39.1	11.068
22	2 41 32.89	2.2316	20 49 40.5	10.977
23	2 43 47.04	2.2402	N.21 0 36.3	10.883

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 46 1.71	2.2487	N.21 11 26.4	10.787
1	2 48 16.89	2.2573	21 22 10.7	10.689
2	2 50 32.59	2.2660	21 32 49.1	10.590
3	2 52 48.81	2.2747	21 43 21.5	10.489
4	2 55 5.55	2.2834	21 53 47.8	10.386
5	2 57 22.82	2.2922	22 4 7.8	10.281
6	2 59 40.62	2.3011	22 14 21.5	10.175
7	3 1 58.95	2.3098	22 24 28.8	10.067
8	3 4 17.80	2.3186	22 34 29.5	9.957
9	3 6 37.18	2.3274	22 44 23.6	9.846
10	3 8 57.09	2.3363	22 54 11.0	9.732
11	3 11 17.54	2.3452	23 3 51.5	9.616
12	3 13 38.52	2.3542	23 13 24.9	9.498
13	3 16 0.04	2.3631	23 22 51.2	9.379
14	3 18 22.09	2.3719	23 32 10.4	9.259
15	3 20 44.67	2.3808	23 41 22.3	9.137
16	3 23 7.79	2.3897	23 50 26.8	9.012
17	3 25 31.44	2.3987	23 59 23.7	8.884
18	3 27 55.63	2.4076	24 8 12.9	8.755
19	3 30 20.35	2.4164	24 16 54.3	8.625
20	3 32 45.60	2.4253	24 25 27.9	8.493
21	3 35 11.39	2.4342	24 33 53.5	8.359
22	3 37 37.71	2.4430	24 42 11.0	8.222
23	3 40 4.55	2.4517	24 50 20.2	8.084
24	3 42 31.92	2.4605	N.24 58 21.1	7.944

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 42 31.92	2.4605	N.24 58 21.1	7.944
1	3 44 59.81	2.4693	25 6 13.5	7.803
2	3 47 28.23	2.4780	25 13 57.4	7.660
3	3 49 57.17	2.4866	25 21 32.7	7.515
4	3 52 26.62	2.4951	25 28 59.2	7.367
5	3 54 56.58	2.5036	25 36 16.7	7.217
6	3 57 27.05	2.5121	25 43 25.2	7.066
7	3 59 58.03	2.5205	25 50 24.6	6.913
8	4 2 29.51	2.5288	25 57 14.8	6.758
9	4 5 1.48	2.5370	26 3 55.6	6.602
10	4 7 33.95	2.5452	26 10 27.0	6.443
11	4 10 6.91	2.5534	26 16 48.8	6.283
12	4 12 40.36	2.5615	26 23 1.0	6.122
13	4 15 14.29	2.5694	26 29 3.4	5.958
14	4 17 48.69	2.5772	26 34 55.9	5.792
15	4 20 23.55	2.5849	26 40 38.4	5.624
16	4 22 58.88	2.5926	26 46 10.8	5.456
17	4 25 34.66	2.6001	26 51 33.0	5.284
18	4 28 10.89	2.6075	26 56 44.9	5.112
19	4 30 47.56	2.6148	27 1 46.4	4.938
20	4 33 24.67	2.6221	27 6 37.4	4.763
21	4 36 2.21	2.6292	27 11 17.9	4.586
22	4 38 40.17	2.6361	27 15 47.7	4.407
23	4 41 18.54	2.6428	N.27 20 6.7	4.225

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 43 57.31	2.6495	N.27 24 14.7	4.043
1	4 46 36.48	2.6561	27 28 11.8	3.860
2	4 49 16.04	2.6624	27 31 57.9	3.675
3	4 51 55.97	2.6686	27 35 32.8	3.487
4	4 54 36.27	2.6747	27 38 56.4	3.299
5	4 57 16.94	2.6807	27 42 8.7	3.111
6	4 59 57.96	2.6865	27 45 9.7	2.921
7	5 2 39.32	2.6921	27 47 59.2	2.728
8	5 5 21.01	2.6974	27 50 37.1	2.534
9	5 8 3.01	2.7026	27 53 3.3	2.339
10	5 10 45.32	2.7077	27 55 17.8	2.144
11	5 13 27.94	2.7127	27 57 20.6	1.948
12	5 16 10.85	2.7174	27 59 11.6	1.750
13	5 18 54.03	2.7219	28 0 50.6	1.550
14	5 21 37.48	2.7262	28 2 17.6	1.350
15	5 24 21.18	2.7303	28 3 32.6	1.149
16	5 27 5.12	2.7343	28 4 35.5	0.947
17	5 29 49.29	2.7381	28 5 26.2	0.744
18	5 32 33.69	2.7417	28 6 4.8	0.541
19	5 35 18.29	2.7450	28 6 31.1	0.336
20	5 38 3.09	2.7482	28 6 45.1	+0.131
21	5 40 48.07	2.7511	28 6 46.8	−0.075
22	5 43 33.22	2.7537	28 6 36.1	0.282
23	5 46 18.52	2.7562	28 6 13.0	0.489
24	5 49 3.97	2.7586	N.28 5 37.4	0.697

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 49 3.97	2.7586	N.28 5 37.4	0.697
1	5 51 49.55	2.7607	28 4 49.4	0.904
2	5 54 35.25	2.7626	28 3 48.9	1.113
3	5 57 21.06	2.7643	28 2 35.8	1.322
4	6 0 6.97	2.7657	28 1 10.2	1.531
5	6 2 52.95	2.7669	27 59 32.1	1.740
6	6 5 39.00	2.7679	27 57 41.4	1.950
7	6 8 25.10	2.7688	27 55 38.1	2.160
8	6 11 11.25	2.7694	27 53 22.2	2.370
9	6 13 57.43	2.7697	27 50 53.7	2.579
10	6 16 43.62	2.7698	27 48 12.7	2.789
11	6 19 29.81	2.7698	27 45 19.0	3.000
12	6 22 16.00	2.7696	27 42 12.7	3.210
13	6 25 2.16	2.7690	27 38 53.8	3.419
14	6 27 48.28	2.7683	27 35 22.4	3.628
15	6 30 34.36	2.7675	27 31 38.4	3.837
16	6 33 20.38	2.7663	27 27 41.9	4.046
17	6 36 6.32	2.7650	27 23 32.9	4.254
18	6 38 52.18	2.7635	27 19 11.4	4.462
19	6 41 37.94	2.7617	27 14 37.4	4.669
20	6 44 23.59	2.7598	27 9 51.1	4.875
21	6 47 9.12	2.7577	27 4 52.4	5.082
22	6 49 54.51	2.7553	26 59 41.3	5.287
23	6 52 39.76	2.7526	N.26 54 18.0	5.491

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 55 24.85	2.7501	N.26 48 42.4	5.695
1	6 58 9.77	2.7472	26 42 54.6	5.897
2	7 0 54.5	2.7441	26 36 54.7	6.099
3	7 3 39.06	2.7408	26 30 42.7	6.301
4	7 6 23.41	2.7373	26 24 18.6	6.501
5	7 9 7.54	2.7337	26 17 42.6	6.699
6	7 11 51.45	2.7298	26 10 54.7	6.897
7	7 14 35.12	2.7258	26 3 55.0	7.093
8	7 17 18.55	2.7217	25 56 43.5	7.289
9	7 20 1.73	2.7175	25 49 20.3	7.483
10	7 22 44.65	2.7130	25 41 45.5	7.676
11	7 25 27.29	2.7083	25 33 59.2	7.867
12	7 28 9.65	2.7036	25 26 1.4	8.057
13	7 30 51.72	2.6987	25 17 52.3	8.246
14	7 33 33.49	2.6937	25 9 31.9	8.433
15	7 36 14.96	2.6885	25 1 0.3	8.619
16	7 38 56.11	2.6832	24 52 17.6	8.803
17	7 41 36.94	2.6777	24 43 23.9	8.986
18	7 44 17.43	2.6721	24 34 19.3	9.167
19	7 46 57.59	2.6665	24 25 3.9	9.346
20	7 49 37.41	2.6607	24 15 37.8	9.523
21	7 52 16.87	2.6547	24 6 1.1	9.699
22	7 54 55.97	2.6487	23 56 13.9	9.873
23	7 57 34.71	2.6426	23 46 16.3	10.046
24	8 0 13.08	2.6363	N.23 36 8.4	10.217

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 0 13.08	2.6363	N.23 36 8.4	10.217
1	8 2 51.07	2.6300	23 25 50.3	10.385
2	8 5 28.68	2.6237	23 15 22.2	10.551
3	8 8 5.91	2.6172	23 4 44.2	10.716
4	8 10 42.75	2.6106	22 53 56.3	10.879
5	8 13 19.19	2.6039	22 42 58.7	11.039
6	8 15 55.22	2.5972	22 31 51.6	11.198
7	8 18 30.85	2.5905	22 20 35.0	11.355
8	8 21 6.08	2.5837	22 9 9.0	11.510
9	8 23 40.89	2.5768	21 57 33.8	11.662
10	8 26 15.29	2.5698	21 45 49.5	11.812
11	8 28 49.27	2.5628	21 33 56.3	11.961
12	8 31 22.83	2.5558	21 21 54.2	12.107
13	8 33 55.97	2.5487	21 9 43.4	12.252
14	8 36 28.68	2.5416	20 57 24.0	12.394
15	8 39 0.96	2.5345	20 44 56.1	12.535
16	8 41 32.82	2.5274	20 32 19.8	12.673
17	8 44 4.25	2.5202	20 19 35.4	12.808
18	8 46 35.24	2.5129	20 6 42.9	12.942
19	8 49 5.80	2.5057	19 53 42.4	13.073
20	8 51 35.93	2.4986	19 40 34.1	13.202
21	8 54 5.63	2.4913	19 27 18.2	13.328
22	8 56 34.89	2.4841	19 13 54.8	13.453
23	8 59 3.72	2.4769	N.19 0 23.9	13.576

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 1 32.12	2.4697	N.18 46 45.7	13.696
1	9 4 0.08	2.4624	18 33 0.4	13.813
2	9 6 27.61	2.4552	18 19 8.1	13.929
3	9 8 54.71	2.4481	18 5 8.9	14.042
4	9 11 21.38	2.4408	17 51 3.0	14.153
5	9 13 47.61	2.4336	17 36 50.5	14.262
6	9 16 13.41	2.4265	17 22 31.5	14.369
7	9 18 38.79	2.4194	17 8 6.2	14.473
8	9 21 3.74	2.4123	16 53 34.7	14.576
9	9 23 28.27	2.4052	16 38 57.1	14.676
10	9 25 52.37	2.3982	16 24 13.6	14.773
11	9 28 16.05	2.3912	16 9 24.3	14.868
12	9 30 39.32	2.3843	15 54 29.4	14.962
13	9 33 2.17	2.3774	15 39 28.9	15.053
14	9 35 24.61	2.3706	15 24 23.1	15.141
15	9 37 46.64	2.3638	15 9 12.0	15.228
16	9 40 8.26	2.3570	14 53 55.7	15.312
17	9 42 29.48	2.3503	14 38 34.5	15.394
18	9 44 50.30	2.3437	14 23 8.4	15.474
19	9 47 10.72	2.3371	14 7 37.6	15.552
20	9 49 30.75	2.3306	13 52 2.2	15.628
21	9 51 50.39	2.3241	13 36 22.3	15.702
22	9 54 9.64	2.3177	13 20 38.0	15.773
23	9 56 28.51	2.3113	13 4 49.6	15.841
24	9 58 47.00	2.3050	N.12 48 57.1	15.906

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 13.					**SUNDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 58 47.00	2.3050	N. 12 48 57.1	15.908	0	11 43 43.04	2.1013	S. 0 34 8.7	16.859
1	10 1 5.11	2.2988	12 33 0.6	15.973	1	11 45 49.06	2.0993	0 50 59.6	16.838
2	10 3 22.86	2.2927	12 17 0.3	16.036	2	11 47 54.96	2.0973	1 7 49.2	16.815
3	10 5 40.24	2.2867	12 0 56.3	16.097	3	11 50 0.74	2.0954	1 24 37.4	16.791
4	10 7 57.26	2.2807	11 44 48.7	16.155	4	11 52 6.41	2.0938	1 41 24.1	16.765
5	10 10 13.92	2.2747	11 28 37.7	16.211	5	11 54 11.99	2.0922	1 58 9.2	16.737
6	10 12 30.22	2.2688	11 12 23.4	16.266	6	11 56 17.47	2.0906	2 14 52.5	16.707
7	10 14 46.17	2.2630	10 56 5.8	16.318	7	11 58 22.86	2.0892	2 31 34.0	16.677
8	10 17 1.78	2.2574	10 39 45.2	16.368	8	12 0 28.17	2.0878	2 48 13.7	16.647
9	10 19 17.06	2.2518	10 23 21.6	16.417	9	12 2 33.39	2.0864	3 4 51.6	16.614
10	10 21 32.00	2.2462	10 6 55.2	16.463	10	12 4 38.54	2.0852	3 21 27.4	16.579
11	10 23 46.61	2.2407	9 50 26.1	16.507	11	12 6 43.62	2.0842	3 38 1.1	16.542
12	10 26 0.89	2.2353	9 33 54.4	16.549	12	12 8 48.64	2.0832	3 54 32.5	16.505
13	10 28 14.85	2.2301	9 17 20.2	16.589	13	12 10 53.60	2.0822	4 11 1.7	16.467
14	10 30 28.50	2.2249	9 0 43.7	16.627	14	12 12 58.51	2.0814	4 27 28.6	16.427
15	10 32 41.83	2.2197	8 44 5.0	16.663	15	12 15 3.37	2.0807	4 43 53.0	16.386
16	10 34 54.86	2.2147	8 27 24.2	16.698	16	12 17 8.19	2.0800	5 0 14.9	16.344
17	10 37 7.59	2.2097	8 10 41.3	16.731	17	12 19 12.97	2.0793	5 16 34.3	16.301
18	10 39 20.03	2.2049	7 53 56.5	16.762	18	12 21 17.71	2.0788	5 32 51.0	16.256
19	10 41 32.18	2.2002	7 37 9.9	16.790	19	12 23 22.43	2.0785	5 49 5.0	16.210
20	10 43 44.05	2.1954	7 20 21.7	16.816	20	12 25 27.13	2.0782	6 5 16.2	16.162
21	10 45 55.63	2.1907	7 3 32.0	16.841	21	12 27 31.81	2.0779	6 21 24.4	16.113
22	10 48 6.94	2.1862	6 46 40.8	16.864	22	12 29 36.48	2.0777	6 37 29.7	16.063
23	10 50 17.98	2.1818	N. 6 29 48.3	16.885	23	12 31 41.14	2.0777	S. 6 53 32.0	16.012
	SATURDAY 14.					**MONDAY 16.**			
0	10 52 28.76	2.1776	N. 6 12 54.6	16.904	0	12 33 45.80	2.0777	S. 7 9 31.1	15.959
1	10 54 39.29	2.1733	5 55 59.8	16.922	1	12 35 50.46	2.0777	7 25 27.0	15.905
2	10 56 49.56	2.1691	5 39 4.0	16.938	2	12 37 55.13	2.0779	7 41 19.7	15.851
3	10 58 59.58	2.1650	5 22 7.3	16.952	3	12 39 59.81	2.0782	7 57 9.1	15.795
4	11 1 9.36	2.1611	5 5 9.8	16.964	4	12 42 4.51	2.0785	8 12 55.1	15.737
5	11 3 18.91	2.1572	4 48 11.6	16.974	5	12 44 9.23	2.0789	8 28 37.6	15.678
6	11 5 28.23	2.1534	4 31 12.9	16.983	6	12 46 13.98	2.0794	8 44 16.5	15.618
7	11 7 37.32	2.1498	4 14 13.7	16.990	7	12 48 18.76	2.0800	8 59 51.8	15.557
8	11 9 46.20	2.1462	3 57 14.1	16.995	8	12 50 23.58	2.0806	9 15 23.4	15.496
9	11 11 54.86	2.1426	3 40 14.3	16.998	9	12 52 28.43	2.0813	9 30 51.3	15.433
10	11 14 3.31	2.1392	3 23 14.3	17.001	10	12 54 33.33	2.0821	9 46 15.3	15.368
11	11 16 11.57	2.1360	3 6 14.2	17.001	11	12 56 38.28	2.0829	10 1 35.4	15.303
12	11 18 19.63	2.1328	2 49 14.2	16.999	12	12 58 43.28	2.0838	10 16 51.6	15.236
13	11 20 27.50	2.1296	2 32 14.3	16.997	13	13 0 48.34	2.0849	10 32 3.7	15.168
14	11 22 35.18	2.1265	2 15 14.6	16.992	14	13 2 53.47	2.0860	10 47 11.7	15.099
15	11 24 42.68	2.1236	1 58 15.3	16.985	15	13 4 58.66	2.0871	11 2 15.6	15.030
16	11 26 50.01	2.1207	1 41 16.4	16.978	16	13 7 3.92	2.0883	11 17 15.3	14.958
17	11 28 57.17	2.1179	1 24 18.0	16.969	17	13 9 9.26	2.0896	11 32 10.6	14.885
18	11 31 4.16	2.1152	1 7 20.1	16.958	18	13 11 14.67	2.0909	11 47 1.5	14.812
19	11 33 11.00	2.1127	0 50 23.0	16.945	19	13 13 20.16	2.0923	12 1 48.0	14.738
20	11 35 17.69	2.1102	0 33 26.7	16.931	20	13 15 25.75	2.0939	12 16 30.0	14.662
21	11 37 24.23	2.1078	N. 0 16 31.3	16.915	21	13 17 31.43	2.0955	12 31 7.4	14.585
22	11 39 30.63	2.1056	S. 0 0 23.1	16.898	22	13 19 37.21	2.0971	12 45 40.2	14.507
23	11 41 36.90	2.1034	0 17 16.5	16.880	23	13 21 43.08	2.0987	13 0 8.3	14.428
24	11 43 43.04	2.1013	S. 0 34 8.7	16.859	24	13 23 49.05	2.1004	S. 13 14 31.6	14.349

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 23 49.05	2.1004	S.13 14 31.6	14.349
1	13 25 55.13	2.1023	13 28 50.1	14.268
2	13 28 1.32	2.1042	13 43 3.7	14.186
3	13 30 7.63	2.1061	13 57 12.4	14.103
4	13 32 14.05	2.1080	14 11 16.1	14.019
5	13 34 20.59	2.1101	14 25 14.7	13.933
6	13 36 27.26	2.1122	14 39 8.1	13.847
7	13 38 34.06	2.1144	14 52 56.3	13.760
8	13 40 40.99	2.1166	15 6 39.3	13.672
9	13 42 48.05	2.1188	15 20 16.9	13.582
10	13 44 55.24	2.1211	15 33 49.1	13.492
11	13 47 2.58	2.1235	15 47 15.9	13.401
12	13 49 10.06	2.1258	16 0 37.2	13.308
13	13 51 17.68	2.1282	16 13 52.9	13.215
14	13 53 25.45	2.1308	16 27 3.0	13.121
15	13 55 33.38	2.1334	16 40 7.4	13.026
16	13 57 41.46	2.1359	16 53 6.1	12.929
17	13 59 49.69	2.1385	17 5 58.9	12.831
18	14 1 58.08	2.1412	17 18 45.8	12.733
19	14 4 6.63	2.1439	17 31 26.8	12.633
20	14 6 15.35	2.1467	17 44 1.8	12.533
21	14 8 24.23	2.1494	17 56 30.8	12.432
22	14 10 33.28	2.1522	18 8 53.7	12.330
23	14 12 42.50	2.1550	S.18 21 10.4	12.228

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 14 51.88	2.1578	S.18 33 21.0	12.124
1	14 17 1.44	2.1608	18 45 25.3	12.018
2	14 19 11.18	2.1637	18 57 23.2	11.913
3	14 21 21.09	2.1667	19 9 14.7	11.805
4	14 23 31.18	2.1697	19 20 59.8	11.697
5	14 25 41.45	2.1727	19 32 38.4	11.588
6	14 27 51.90	2.1757	19 44 10.4	11.478
7	14 30 2.53	2.1787	19 55 35.8	11.368
8	14 32 13.34	2.1817	20 6 54.6	11.257
9	14 34 24.34	2.1848	20 18 6.7	11.145
10	14 36 35.52	2.1879	20 29 12.0	11.031
11	14 38 46.89	2.1911	20 40 10.4	10.917
12	14 40 58.45	2.1942	20 51 2.0	10.803
13	14 43 10.19	2.1972	21 1 46.7	10.687
14	14 45 22.12	2.2003	21 12 24.4	10.569
15	14 47 34.23	2.2034	21 22 55.0	10.452
16	14 49 46.53	2.2066	21 33 18.6	10.334
17	14 51 59.02	2.2098	21 43 35.1	10.215
18	14 54 11.71	2.2130	21 53 44.4	10.095
19	14 56 24.58	2.2161	22 3 46.5	9.974
20	14 58 37.64	2.2192	22 13 41.3	9.852
21	15 0 50.88	2.2223	22 23 28.7	9.729
22	15 3 4.31	2.2254	22 33 8.8	9.606
23	15 5 17.93	2.2286	22 42 41.4	9.482
24	15 7 31.74	2.2317	S.22 52 6.5	9.356

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 7 31.74	2.2317	S.22 52 6.5	9.356
1	15 9 45.73	2.2347	23 1 24.1	9.230
2	15 11 59.91	2.2378	23 10 34.1	9.104
3	15 14 14.27	2.2408	23 19 36.6	8.977
4	15 16 28.81	2.2438	23 28 31.4	8.849
5	15 18 43.53	2.2469	23 37 18.5	8.721
6	15 20 58.44	2.2500	23 45 57.9	8.592
7	15 23 13.53	2.2529	23 54 29.5	8.461
8	15 25 28.79	2.2558	24 2 53.2	8.330
9	15 27 44.22	2.2587	24 11 9.1	8.198
10	15 29 59.83	2.2616	24 19 17.0	8.066
11	15 32 15.61	2.2644	24 27 17.0	7.933
12	15 34 31.56	2.2672	24 35 9.0	7.800
13	15 36 47.68	2.2700	24 42 53.0	7.665
14	15 39 3.96	2.2728	24 50 28.8	7.529
15	15 41 20.41	2.2755	24 57 56.5	7.394
16	15 43 37.02	2.2781	25 5 16.1	7.258
17	15 45 53.78	2.2807	25 12 27.5	7.122
18	15 48 10.70	2.2833	25 19 30.7	6.984
19	15 50 27.77	2.2858	25 26 25.6	6.846
20	15 52 44.99	2.2883	25 33 12.2	6.707
21	15 55 2.36	2.2908	25 39 50.5	6.568
22	15 57 19.88	2.2931	25 46 20.4	6.428
23	15 59 37.53	2.2953	S.25 52 41.9	6.288

FRIDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 1 55.32	2.2976	S.25 58 55.0	6.148
1	16 4 13.24	2.2998	26 4 59.7	6.007
2	16 6 31.29	2.3019	26 10 55.8	5.864
3	16 8 49.47	2.3040	26 16 43.4	5.722
4	16 11 7.77	2.3060	26 22 22.5	5.580
5	16 13 26.19	2.3080	26 27 58.0	5.437
6	16 15 44.73	2.3099	26 33 14.9	5.292
7	16 18 3.38	2.3117	26 38 28.2	5.149
8	16 20 22.13	2.3133	26 43 32.8	5.005
9	16 22 40.98	2.3150	26 48 28.8	4.861
10	16 24 59.93	2.3166	26 53 16.1	4.715
11	16 27 18.97	2.3181	26 57 54.6	4.569
12	16 29 38.10	2.3196	27 2 24.4	4.424
13	16 31 57.32	2.3209	27 6 45.5	4.278
14	16 34 16.61	2.3222	27 10 57.8	4.132
15	16 36 35.98	2.3234	27 15 1.3	3.985
16	16 38 55.42	2.3246	27 18 56.0	3.838
17	16 41 14.93	2.3256	27 22 41.9	3.691
18	16 43 34.49	2.3265	27 26 18.9	3.543
19	16 45 54.11	2.3274	27 29 47.1	3.396
20	16 48 13.78	2.3282	27 33 6.4	3.248
21	16 50 33.49	2.3288	27 36 16.9	3.101
22	16 52 53.24	2.3294	27 39 18.5	2.953
23	16 55 13.02	2.3299	27 42 11.2	2.804
24	16 57 32.83	2.3303	S.27 44 55.0	2.656

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 57 32.83	2.3303	S.27 44 55.0	2.656
1	16 59 52.66	2.3307	27 47 29.9	2.507
2	17 2 12.51	2.3310	27 49 55.9	2.359
3	17 4 32.38	2.3312	27 52 13.0	2.211
4	17 6 52.25	2.3312	27 54 21.2	2.062
5	17 9 12.13	2.3312	27 56 20.4	1.913
6	17 11 32.00	2.3311	27 58 10.7	1.764
7	17 13 51.86	2.3308	27 59 52.1	1.616
8	17 16 11.70	2.3306	28 1 24.6	1.467
9	17 18 31.53	2.3302	28 2 48.2	1.319
10	17 20 51.33	2.3297	28 4 2.9	1.171
11	17 23 11.09	2.3290	28 5 8.7	1.022
12	17 25 30.81	2.3283	28 6 5.6	0.874
13	17 27 50.49	2.3276	28 6 53.6	0.726
14	17 30 10.12	2.3267	28 7 32.7	0.578
15	17 32 29.70	2.3258	28 8 3.0	0.431
16	17 34 49.22	2.3247	28 8 24.4	0.283
17	17 37 8.66	2.3234	28 8 36.9	−0.135
18	17 39 28.03	2.3222	28 8 40.6	+0.012
19	17 41 47.32	2.3208	28 8 35.5	0.158
20	17 44 6.53	2.3194	28 8 21.6	0.305
21	17 46 25.65	2.3179	28 7 58.9	0.452
22	17 48 44.68	2.3162	28 7 27.4	0.598
23	17 51 3.60	2.3144	S.28 6 47.2	0.743

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 53 22.41	2.3126	S.28 5 58.3	0.888
1	17 55 41.11	2.3107	28 5 0.6	1.033
2	17 57 59.70	2.3087	28 3 54.3	1.177
3	18 0 18.16	2.3066	28 2 39.3	1.322
4	18 2 36.49	2.3044	28 1 15.7	1.466
5	18 4 54.69	2.3022	27 59 43.4	1.610
6	18 7 12.75	2.2998	27 58 2.5	1.753
7	18 9 30.67	2.2973	27 56 13.0	1.895
8	18 11 48.43	2.2948	27 54 15.1	2.036
9	18 14 6.04	2.2922	27 52 8.7	2.177
10	18 16 23.49	2.2895	27 49 53.8	2.319
11	18 18 40.78	2.2867	27 47 30.4	2.460
12	18 20 57.90	2.2838	27 44 58.6	2.600
13	18 23 14.84	2.2808	27 42 18.4	2.739
14	18 25 31.60	2.2778	27 39 29.9	2.878
15	18 27 48.18	2.2747	27 36 33.1	3.016
16	18 30 4.57	2.2715	27 33 28.0	3.153
17	18 32 20.76	2.2682	27 30 14.7	3.290
18	18 34 36.76	2.2649	27 26 53.2	3.427
19	18 36 52.55	2.2615	27 23 23.5	3.562
20	18 39 8.14	2.2581	27 19 45.7	3.697
21	18 41 23.52	2.2546	27 15 59.8	3.832
22	18 43 38.69	2.2509	27 12 5.9	3.965
23	18 45 53.63	2.2472	27 8 4.0	4.098
24	18 48 8.35	2.2434	S.27 3 54.1	4.231

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 48 8.35	2.2434	S.27 3 54.1	4.231
1	18 50 22.84	2.2396	26 59 36.3	4.362
2	18 52 37.10	2.2357	26 55 10.7	4.493
3	18 54 51.13	2.2318	26 50 37.2	4.623
4	18 57 4.92	2.2278	26 45 55.9	4.752
5	18 59 18.46	2.2237	26 41 6.9	4.880
6	19 1 31.76	2.2196	26 36 10.3	5.008
7	19 3 44.81	2.2154	26 31 6.0	5.135
8	19 5 57.61	2.2112	26 25 54.1	5.261
9	19 8 10.16	2.2070	26 20 34.7	5.386
10	19 10 22.45	2.2027	26 15 7.8	5.510
11	19 12 34.48	2.1983	26 9 33.5	5.634
12	19 14 46.24	2.1938	26 3 51.7	5.757
13	19 16 57.74	2.1894	25 58 2.6	5.879
14	19 19 8.97	2.1848	25 52 6.2	6.000
15	19 21 19.92	2.1803	25 46 2.6	6.120
16	19 23 30.60	2.1758	25 39 51.8	6.239
17	19 25 41.01	2.1712	25 33 33.9	6.358
18	19 27 51.14	2.1665	25 27 8.8	6.477
19	19 30 0.99	2.1618	25 20 36.7	6.593
20	19 32 10.56	2.1571	25 13 57.7	6.708
21	19 34 19.84	2.1523	25 7 11.7	6.823
22	19 36 28.84	2.1476	25 0 18.9	6.937
23	19 38 37.55	2.1428	S.24 53 19.3	7.050

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 40 45.97	2.1379	S.24 46 12.9	7.162
1	19 42 54.10	2.1331	24 38 59.8	7.273
2	19 45 1.94	2.1282	24 31 40.1	7.383
3	19 47 9.49	2.1233	24 24 13.8	7.492
4	19 49 16.74	2.1184	24 16 41.0	7.601
5	19 51 23.70	2.1136	24 9 1.7	7.708
6	19 53 30.37	2.1087	24 1 16.0	7.815
7	19 55 36.74	2.1037	23 53 23.9	7.920
8	19 57 42.81	2.0987	23 45 25.6	8.024
9	19 59 48.58	2.0937	23 37 21.0	8.128
10	20 1 54.05	2.0887	23 29 10.2	8.231
11	20 3 59.23	2.0838	23 20 53.3	8.332
12	20 6 4.11	2.0788	23 12 30.3	8.433
13	20 8 8.69	2.0738	23 4 1.3	8.533
14	20 10 12.97	2.0688	22 55 26.3	8.632
15	20 12 16.95	2.0638	22 46 45.5	8.729
16	20 14 20.63	2.0588	22 37 58.8	8.826
17	20 16 24.01	2.0539	22 29 6.4	8.922
18	20 18 27.10	2.0490	22 20 8.2	9.017
19	20 20 29.89	2.0440	22 11 4.3	9.111
20	20 22 32.38	2.0390	22 1 54.9	9.203
21	20 24 34.57	2.0341	21 52 39.9	9.296
22	20 26 36.47	2.0292	21 43 19.4	9.387
23	20 28 38.07	2.0242	21 33 53.5	9.477
24	20 30 39.37	2.0193	S.21 24 22.2	9.566

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 30 39.37	2.0193	S. 21 24 22.2	9.566
1	20 32 40.38	2.0144	21 14 45.6	9.654
2	20 34 41.10	2.0096	21 5 3.7	9.741
3	20 36 41.53	2.0047	20 55 16.7	9.827
4	20 38 41.67	1.9998	20 45 24.5	9.912
5	20 40 41.51	1.9949	20 35 27.2	9.996
6	20 42 41.06	1.9902	20 25 25.0	10.079
7	20 44 40.33	1.9854	20 15 17.8	10.162
8	20 46 39.31	1.9807	20 5 5.6	10.243
9	20 48 38.01	1.9760	19 54 48.6	10.323
10	20 50 36.43	1.9712	19 44 26.8	10.403
11	20 52 34.56	1.9665	19 34 0.2	10.482
12	20 54 32.41	1.9619	19 23 28.9	10.560
13	20 56 29.99	1.9573	19 12 53.0	10.637
14	20 58 27.29	1.9527	19 2 12.5	10.712
15	21 0 24.31	1.9481	18 51 27.6	10.786
16	21 2 21.06	1.9437	18 40 38.2	10.860
17	21 4 17.55	1.9392	18 29 44.4	10.932
18	21 6 13.77	1.9347	18 18 46.3	11.004
19	21 8 9.72	1.9303	18 7 43.9	11.076
20	21 10 5.41	1.9260	17 56 37.2	11.146
21	21 12 0.84	1.9217	17 45 26.4	11.214
22	21 13 56.01	1.9173	17 34 11.5	11.283
23	21 15 50.92	1.9130	S. 17 22 52.5	11.351

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 17 45.57	1.9088	S. 17 11 29.4	11.417
1	21 19 39.97	1.9047	17 0 2.4	11.482
2	21 21 34.13	1.9006	16 48 31.5	11.547
3	21 23 28.04	1.8965	16 36 56.8	11.610
4	21 25 21.71	1.8924	16 25 18.3	11.672
5	21 27 15.13	1.8883	16 13 36.1	11.735
6	21 29 8.31	1.8844	16 1 50.1	11.797
7	21 31 1.26	1.8806	15 50 0.5	11.856
8	21 32 53.98	1.8767	15 38 7.4	11.915
9	21 34 46.46	1.8729	15 26 10.7	11.974
10	21 36 38.72	1.8692	15 14 10.5	12.032
11	21 38 30.76	1.8654	15 2 6.9	12.088
12	21 40 22.57	1.8617	14 50 0.0	12.143
13	21 42 14.16	1.8581	14 37 49.7	12.199
14	21 44 5.54	1.8546	14 25 36.1	12.253
15	21 45 56.71	1.8511	14 13 19.4	12.305
16	21 47 47.67	1.8476	14 0 59.5	12.358
17	21 49 38.42	1.8442	13 48 36.4	12.410
18	21 51 28.97	1.8408	13 36 10.3	12.460
19	21 53 19.32	1.8375	13 23 41.2	12.510
20	21 55 9.47	1.8342	13 11 9.1	12.560
21	21 56 59.43	1.8311	12 58 34.0	12.608
22	21 58 49.20	1.8280	12 45 56.1	12.655
23	22 0 38.79	1.8249	12 33 15.4	12.702
24	22 2 28.19	1.8218	S. 12 20 31.9	12.747

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	22 2 28.19	1.8218	S. 12 20 31.9	12.747
1	22 4 17.41	1.8189	12 7 45.7	12.792
2	22 6 6.46	1.8160	11 54 56.8	12.837
3	22 7 55.33	1.8131	11 42 5.3	12.880
4	22 9 44.03	1.8103	11 29 11.2	12.922
5	22 11 32.57	1.8077	11 16 14.6	12.963
6	22 13 20.95	1.8050	11 3 15.6	13.004
7	22 15 9.17	1.8023	10 50 14.1	13.045
8	22 16 57.23	1.7997	10 37 10.2	13.084
9	22 18 45.14	1.7973	10 24 4.0	13.123
10	22 20 32.91	1.7949	10 10 55.5	13.161
11	22 22 20.53	1.7925	9 57 44.7	13.198
12	22 24 8.01	1.7902	9 44 31.7	13.235
13	22 25 55.36	1.7880	9 31 16.5	13.270
14	22 27 42.57	1.7858	9 17 59.3	13.304
15	22 29 29.65	1.7837	9 4 40.0	13.338
16	22 31 16.61	1.7817	8 51 18.7	13.372
17	22 33 3.45	1.7797	8 37 55.4	13.404
18	22 34 50.17	1.7778	8 24 30.2	13.436
19	22 36 36.78	1.7759	8 11 3.1	13.467
20	22 38 23.28	1.7741	7 57 34.2	13.497
21	22 40 9.67	1.7723	7 44 3.5	13.527
22	22 41 55.96	1.7707	7 30 31.0	13.556
23	22 43 42.15	1.7691	S. 7 16 56.8	13.583

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 45 28.25	1.7676	S. 7 3 21.0	13.611
1	22 47 14.26	1.7661	6 49 43.5	13.638
2	22 49 0.18	1.7647	6 36 4.5	13.663
3	22 50 46.02	1.7633	6 22 24.0	13.688
4	22 52 31.78	1.7621	6 8 42.0	13.713
5	22 54 17.47	1.7609	5 54 58.5	13.737
6	22 56 3.09	1.7598	5 41 13.6	13.760
7	22 57 48.65	1.7587	5 27 27.3	13.782
8	22 59 34.14	1.7577	5 13 39.8	13.803
9	23 1 19.57	1.7567	4 59 51.0	13.823
10	23 3 4.95	1.7559	4 46 1.0	13.843
11	23 4 50.28	1.7552	4 32 9.8	13.863
12	23 6 35.57	1.7545	4 18 17.4	13.882
13	23 8 20.82	1.7538	4 4 23.9	13.900
14	23 10 6.03	1.7532	3 50 29.4	13.917
15	23 11 51.21	1.7527	3 36 33.9	13.933
16	23 13 36.36	1.7523	3 22 37.4	13.950
17	23 15 21.49	1.7519	3 8 39.9	13.965
18	23 17 6.59	1.7516	2 54 41.6	13.979
19	23 18 51.68	1.7514	2 40 42.4	13.993
20	23 20 36.76	1.7513	2 26 42.4	14.006
21	23 22 21.83	1.7512	2 12 41.7	14.017
22	23 24 6.90	1.7512	1 58 40.3	14.029
23	23 25 51.97	1.7513	1 44 38.2	14.041
24	23 27 37.05	1.7514	S. 1 30 35.4	14.052

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 27 37.05	1.7514	S. 1 30 35.4	14.052
1	23 29 22.14	1.7516	1 16 32.0	14.061
2	23 31 7.24	1.7518	1 2 28.1	14.069
3	23 32 52.36	1.7522	0 48 23.7	14.078
4	23 34 37.51	1.7527	0 34 18.8	14.086
5	23 36 22.69	1.7532	0 20 13.4	14.092
6	23 38 7.89	1.7537	S. 0 6 7.7	14.098
7	23 39 53.13	1.7544	N. 0 7 58.4	14.103
8	23 41 38.42	1.7552	0 22 4.7	14.108
9	23 43 23.75	1.7559	0 36 11.3	14.112
10	23 45 9.13	1.7568	0 50 18.1	14.115
11	23 46 54.57	1.7578	1 4 25.1	14.117
12	23 48 40.07	1.7588	1 18 32.2	14.119
13	23 50 25.63	1.7599	1 32 39.4	14.120
14	23 52 11.26	1.7611	1 46 46.6	14.121
15	23 53 56.96	1.7623	2 0 53.9	14.121
16	23 55 42.74	1.7637	2 15 1.1	14.119
17	23 57 28.60	1.7651	2 29 8.2	14.117
18	23 59 14.55	1.7666	2 43 15.1	14.114
19	0 1 0.59	1.7682	2 57 21.9	14.112
20	0 2 46.73	1.7698	3 11 28.5	14.108
21	0 4 32.96	1.7714	3 25 34.8	14.103
22	0 6 19.30	1.7732	3 39 40.8	14.097
23	0 8 5.75	1.7752	N. 3 53 46.4	14.091

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 9 52.32	1.7772	N. 4 7 51.7	14.085
1	0 11 39.01	1.7792	4 21 56.6	14.077
2	0 13 25.82	1.7812	4 36 1.0	14.068
3	0 15 12.75	1.7833	4 50 4.8	14.058
4	0 16 59.82	1.7856	5 4 8.0	14.048
5	0 18 47.03	1.7880	5 18 10.6	14.037
6	0 20 34.38	1.7904	5 32 12.5	14.026
7	0 22 21.88	1.7929	5 46 13.7	14.014
8	0 24 9.53	1.7955	6 0 14.2	14.002
9	0 25 57.34	1.7982	6 14 13.9	13.988
10	0 27 45.31	1.8009	6 28 12.7	13.973
11	0 29 33.44	1.8037	6 42 10.6	13.958
12	0 31 21.75	1.8067	6 56 7.6	13.942
13	0 33 10.24	1.8097	7 10 3.6	13.924
14	0 34 58.91	1.8127	7 23 58.5	13.907
15	0 36 47.76	1.8158	7 37 52.4	13.888
16	0 38 36.80	1.8190	7 51 45.1	13.868
17	0 40 26.04	1.8223	8 5 36.6	13.848
18	0 42 15.48	1.8257	8 19 26.9	13.827
19	0 44 5.12	1.8292	8 33 15.9	13.805
20	0 45 54.98	1.8327	8 47 3.5	13.782
21	0 47 45.05	1.8363	9 0 49.8	13.759
22	0 49 35.34	1.8401	9 14 34.6	13.734
23	0 51 25.86	1.8438	9 28 17.9	13.709
24	0 53 16.60	1.8477	N. 9 41 59.7	13.683

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 53 16.60	1.8477	N. 9 41 59.7	13.683
1	0 55 7.58	1.8517	9 55 39.9	13.656
2	0 56 58.80	1.8557	10 9 18.4	13.627
3	0 58 50.26	1.8598	10 22 55.2	13.598
4	1 0 41.97	1.8640	10 36 30.2	13.568
5	1 2 33.94	1.8683	10 50 3.4	13.538
6	1 4 26.17	1.8727	11 3 34.8	13.507
7	1 6 18.67	1.8772	11 17 4.3	13.474
8	1 8 11.43	1.8816	11 30 31.7	13.440
9	1 10 4.46	1.8862	11 43 57.1	13.406
10	1 11 57.77	1.8909	11 57 20.4	13.370
11	1 13 51.37	1.8956	12 10 41.5	13.334
12	1 15 45.25	1.9004	12 24 0.5	13.297
13	1 17 39.42	1.9054	12 37 17.2	13.258
14	1 19 33.90	1.9105	12 50 31.5	13.218
15	1 21 28.68	1.9156	13 3 43.4	13.178
16	1 23 23.77	1.9208	13 16 52.9	13.137
17	1 25 19.17	1.9260	13 29 59.8	13.094
18	1 27 14.89	1.9313	13 43 4.2	13.051
19	1 29 10.93	1.9367	13 56 5.9	13.006
20	1 31 7.30	1.9422	14 9 4.9	12.961
21	1 33 3.99	1.9477	14 22 1.2	12.914
22	1 35 1.02	1.9534	14 34 54.6	12.866
23	1 36 58.40	1.9592	N. 14 47 45.1	12.817

WEDNESDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 38 56.13	1.9651	N. 15 0 32.7	12.767

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter, . .	3	9	2.0
●	New Moon, . .	10	10	6.1
☽	First Quarter, . .	17	1	12.6
○	Full Moon, . . .	24	19	19.5

		d	h
☾	Perigee, ...	11	14.2
☾	Apogee, ...	26	17.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Jupiter	W.	76° 2′ 17″	3022	77° 32′ 3″	3017	79° 1′ 55″	3012	80° 31′ 53″	3006
	α Aquilæ	W.	50 0 4	4431	51 4 57	4369	52 10 46	4311	53 17 28	4256
	α Arietis	E.	53 4 19	3079	51 35 44	3077	50 7 6	3073	48 38 23	3069
	Aldebaran	E.	84 51 8	3125	83 23 29	3121	81 55 45	3116	80 27 55	3111
	Sun	E.	116 20 17	3427	114 58 31	3422	113 36 39	3415	112 14 40	3409
2	Jupiter	W.	88 3 35	2973	89 34 22	2965	91 5 18	2957	92 36 25	2948
	α Aquilæ	W.	59 2 50	4028	60 14 2	3990	61 25 51	3953	62 38 17	3918
	α Arietis	E.	41 13 32	3046	39 44 16	3041	38 14 54	3036	36 45 26	3030
	Aldebaran	E.	73 7 10	3082	71 38 39	3077	70 10 1	3069	68 41 14	3063
	Sun	E.	105 22 50	3372	104 0 1	3363	102 37 2	3353	101 13 52	3343
3	Jupiter	W.	100 14 55	2898	101 47 16	2887	103 19 51	2876	104 52 41	2864
	α Aquilæ	W.	68 48 57	3763	70 4 38	3735	71 20 48	3709	72 37 26	3682
	Fomalhaut	W.	42 0 34	3634	43 18 32	3584	44 37 24	3536	45 57 8	3491
	Mars	W.	26 17 17	3135	27 44 44	3116	29 12 34	3097	30 40 47	3078
	Aldebaran	E.	61 15 3	3023	59 45 19	3015	58 15 25	3006	56 45 20	2996
	Sun	E.	94 15 0	3288	92 50 34	3275	91 25 53	3262	90 0 57	3248
4	α Aquilæ	W.	79 7 16	3565	80 26 29	3543	81 46 6	3522	83 6 6	3503
	Fomalhaut	W.	52 47 29	3300	54 11 40	3268	55 36 29	3236	57 1 56	3205
	Mars	W.	38 7 27	2989	39 37 53	2971	41 8 42	2954	42 39 53	2936
	Saturn	W.	29 53 27	2852	31 26 47	2835	33 0 30	2817	34 34 36	2800
	Aldebaran	E.	49 12 19	2957	47 41 12	2949	46 9 55	2942	44 38 29	2935
	Sun	E.	82 52 8	3176	81 25 30	3160	79 58 33	3143	78 31 16	3127
5	Fomalhaut	W.	64 18 1	3064	65 46 55	3037	67 16 22	3012	68 46 20	2987
	Mars	W.	50 21 32	2844	51 55 3	2825	53 28 59	2806	55 3 19	2787
	Saturn	W.	42 30 48	2712	44 7 12	2693	45 44 1	2675	47 21 14	2657
	α Pegasi	W.	42 17 54	3175	43 44 33	3130	45 12 6	3088	46 40 30	3048
	Aldebaran	E.	36 59 35	2917	35 27 38	2919	33 55 43	2922	32 23 52	2929
	Sun	E.	71 9 44	3040	69 40 21	3022	68 10 35	3004	66 40 27	2985
6	Fomalhaut	W.	76 23 49	2869	77 56 47	2847	79 30 14	2825	81 4 9	2805
	Mars	W.	63 1 18	2690	64 38 11	2671	66 15 30	2651	67 53 16	2632
	Saturn	W.	55 33 34	2564	57 13 18	2545	58 53 28	2527	60 34 4	2507
	α Pegasi	W.	54 14 6	2875	55 46 57	2845	57 20 27	2815	58 54 36	2786
	Sun	E.	59 3 51	2890	57 31 19	2870	55 58 22	2852	54 25 1	2832
7	Fomalhaut	W.	89 0 24	2707	90 36 55	2689	92 13 50	2672	93 51 8	2655
	Mars	W.	76 8 40	2535	77 49 4	2516	79 29 55	2497	81 11 12	2479
	Saturn	W.	69 3 39	2415	70 46 52	2396	72 30 32	2378	74 14 38	2360
	α Pegasi	W.	66 54 23	2655	68 32 3	2632	70 10 15	2608	71 48 59	2585
	Sun	E.	46 32 1	2737	44 56 10	2719	43 19 55	2701	41 43 16	2682
8	Saturn	W.	83 1 31	2274	84 48 9	2258	86 35 10	2242	88 22 35	2227
	Sun	E.	33 34 8	2599	31 55 12	2585	30 15 57	2572	28 36 23	2559
12	Sun	W.	22 17 36	2363	24 2 4	2361	25 46 35	2359	27 31 8	2359
	Spica	E.	69 49 45	2028	67 56 54	2032	66 4 9	2036	64 11 31	2041
13	Sun	W.	36 13 7	2381	37 57 9	2388	39 41 1	2396	41 24 42	2405
	Spica	E.	54 50 32	2075	52 58 54	2083	51 7 29	2092	49 16 18	2102

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Jupiter	W.	82° 1′ 58″	3001	83° 32′ 10″	2994	85° 2′ 30″	2988	86° 32′ 58″	2981
	α Aquilæ	W.	54 25 1	4206	55 33 22	4158	56 42 28	4112	57 52 18	4069
	α Arietis	E.	47 9 36	3065	45 40 43	3060	44 11 45	3056	42 42 41	3052
	Aldebaran	E.	78 59 59	3106	77 31 57	3101	76 3 48	3096	74 35 33	3089
	Sun	E.	110 52 34	3409	109 30 20	3396	108 7 59	3388	106 45 29	3380
2	Jupiter	W.	94 7 43	2939	95 39 13	2930	97 10 54	2920	98 42 48	2909
	α Aquilæ	W.	63 51 19	3864	65 4 55	3839	66 19 4	3815	67 33 45	3791
	α Arietis	E.	35 15 51	3026	33 46 10	3021	32 16 23	3017	30 46 31	3013
	Aldebaran	E.	67 12 19	3055	65 43 14	3047	64 14 0	3039	62 44 36	3032
	Sun	E.	99 50 30	3333	98 26 57	3322	97 3 11	3311	95 39 12	3300
3	Jupiter	W.	106 25 46	2858	107 59 7	2839	109 32 44	2826	111 6 38	2813
	α Aquilæ	W.	73 54 32	3657	75 12 5	3634	76 30 3	3610	77 48 27	3587
	Fomalhaut	W.	47 17 42	3449	48 39 3	3409	50 1 9	3372	51 23 58	3335
	Mars	W.	32 9 23	3060	33 38 21	3043	35 7 41	3025	36 37 23	3007
	Aldebaran	E.	55 15 5	2989	53 44 39	2981	52 14 3	2973	50 43 16	2965
	Sun	E.	88 35 45	3236	87 10 17	3220	85 44 32	3205	84 18 29	3190
4	α Aquilæ	W.	84 26 27	3483	85 47 10	3463	87 8 15	3446	88 29 40	3429
	Fomalhaut	W.	58 27 59	3175	59 54 38	3146	61 21 52	3118	62 49 40	3091
	Mars	W.	44 11 26	2918	45 43 22	2899	47 15 42	2881	48 48 25	2862
	Saturn	W.	36 9 4	2785	37 43 55	2766	39 19 9	2747	40 54 47	2729
	Aldebaran	E.	43 6 54	2929	41 35 12	2924	40 3 24	2920	38 31 31	2918
	Sun	E.	77 3 39	3110	75 35 42	3093	74 7 24	3076	72 38 45	3058
5	Fomalhaut	W.	70 16 49	2963	71 47 49	2939	73 19 19	2915	74 51 19	2891
	Mars	W.	56 38 4	2768	58 13 14	2748	59 48 50	2729	61 24 51	2710
	Saturn	W.	48 58 52	2639	50 36 54	2620	52 15 22	2601	53 54 15	2583
	α Pegasi	W.	48 9 43	3010	49 39 43	2974	51 10 28	2940	52 41 56	2907
	Aldebaran	E.	30 52 10	2940	29 20 42	2956	27 49 34	2978	26 18 54	3009
	Sun	E.	65 9 55	2966	63 39 0	2947	62 7 41	2928	60 35 58	2909
6	Fomalhaut	W.	82 38 31	2784	84 13 20	2763	85 48 36	2744	87 24 17	2725
	Mars	W.	69 31 28	2612	71 10 6	2593	72 49 11	2574	74 28 42	2554
	Saturn	W.	62 15 7	2489	63 56 36	2471	65 38 30	2452	67 20 51	2433
	α Pegasi	W.	60 29 22	2758	62 4 45	2732	63 40 43	2706	65 17 16	2680
	Sun	E.	52 51 15	2813	51 17 4	2794	49 42 28	2775	48 7 27	2756
7	Fomalhaut	W.	95 28 49	2639	97 6 51	2624	98 45 13	2610	100 23 54	2596
	Mars	W.	82 52 55	2460	84 35 4	2443	86 17 38	2425	88 0 38	2408
	Saturn	W.	75 59 10	2343	77 44 7	2325	79 29 30	2306	81 15 18	2288
	α Pegasi	W.	73 28 14	2564	75 7 59	2543	76 48 12	2522	78 28 54	2503
	Sun	E.	40 6 12	2665	38 28 45	2648	36 50 55	2632	35 12 43	2615
8	Saturn	W.	90 10 23	2211	91 58 34	2197	93 47 6	2182	95 36 0	2169
	Sun	E.	26 56 31	2547	25 16 23	2536	23 36 2	2525	21 55 30	2514
12	Sun	W.	29 15 41	2960	31 0 11	2964	32 44 37	2969	34 28 56	2975
	Spica	E.	62 19 0	2046	60 26 38	2052	58 34 25	2059	56 42 23	2066
13	Sun	W.	43 8 10	2414	44 51 25	2424	46 34 25	2435	48 17 10	2446
	Spica	E.	47 25 22	2112	45 34 41	2123	43 44 17	2134	41 54 10	2145

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Antares	E.	100° 43′ 16″	2071	98° 51′ 32″	2079	97° 0′ 1″	2088	95° 8′ 44″	2096
14	Sun	W.	49 59 39	2456	51 41 52	2470	53 23 47	2483	55 5 24	2495
	Venus	W.	31 34 10	2530	33 14 41	2543	34 54 54	2557	36 34 48	2570
	Spica	E.	40 4 20	2158	38 14 49	2170	36 25 37	2183	34 36 44	2197
	Antares	E.	85 56 11	2152	84 6 31	2164	82 17 9	2176	80 28 6	2189
	Jupiter	E.	103 45 22	2138	101 55 21	2151	100 5 39	2163	98 16 15	2175
15	Sun	W.	63 28 49	2566	65 8 31	2581	66 47 52	2596	68 26 52	2611
	Venus	W.	44 49 29	2644	46 27 24	2660	48 4 58	2675	49 42 11	2691
	Regulus	W.	28 28 47	2257	30 15 50	2270	32 2 33	2285	33 48 54	2300
	Antares	E.	71 27 45	2257	69 40 42	2271	67 54 0	2285	66 7 39	2300
	Jupiter	E.	89 14 7	2243	87 26 42	2257	85 39 39	2271	83 52 57	2286
16	Sun	W.	76 36 39	2689	78 13 33	2705	79 50 6	2722	81 26 17	2738
	Venus	W.	57 42 56	2772	59 18 1	2788	60 52 44	2805	62 27 6	2821
	Regulus	W.	42 35 20	2373	44 19 33	2389	46 3 24	2403	47 46 54	2418
	Antares	E.	57 21 15	2374	55 37 3	2389	53 53 12	2403	52 9 42	2419
	Jupiter	E.	75 4 53	2361	73 20 22	2375	71 36 12	2391	69 52 24	2406
17	Sun	W.	89 22 1	2816	90 56 8	2831	92 29 55	2847	94 3 22	2862
	Venus	W.	70 13 41	2901	71 45 58	2918	73 17 54	2934	74 49 30	2949
	Regulus	W.	56 19 8	2492	58 0 33	2507	59 41 37	2521	61 22 21	2535
	Antares	E.	43 37 32	2492	41 56 8	2507	40 15 5	2522	38 34 22	2535
	Jupiter	E.	61 18 53	2483	59 37 16	2498	57 56 0	2513	56 15 5	2528
18	Sun	W.	101 45 48	2936	103 17 21	2950	104 48 36	2965	106 19 33	2979
	Venus	W.	82 22 42	3025	83 52 24	3039	85 21 48	3054	86 50 54	3068
	Regulus	W.	69 41 12	2604	71 20 2	2617	72 58 34	2630	74 36 48	2643
	Spica	W.	15 45 51	2635	17 23 59	2643	19 1 56	2652	20 39 41	2662
	Antares	E.	30 15 36	2605	28 36 48	2618	26 58 18	2632	25 20 6	2644
	Jupiter	E.	47 55 45	2604	46 16 55	2619	44 38 26	2634	43 0 17	2649
	α Aquilæ	E.	85 41 17	3325	84 17 34	3342	82 54 11	3360	81 31 9	3380
19	Sun	W.	113 50 2	3045	115 19 19	3058	116 48 20	3070	118 17 6	3082
	Venus	W.	94 12 9	3136	95 39 35	3148	97 6 46	3161	98 33 42	3174
	Regulus	W.	82 43 41	2704	84 20 15	2716	85 56 33	2728	87 32 36	2739
	Spica	W.	28 44 57	2715	30 21 17	2725	31 57 23	2736	33 33 15	2747
	Jupiter	E.	34 54 41	2727	33 18 37	2743	31 42 54	2760	30 7 33	2778
	α Aquilæ	E.	74 41 50	3489	73 21 14	3515	72 1 6	3541	70 41 27	3567
20	Spica	W.	41 29 9	2798	43 3 40	2807	44 37 59	2816	46 12 6	2825
	α Aquilæ	E.	64 11 4	3726	62 54 44	3763	61 39 3	3801	60 24 2	3843
21	Spica	W.	53 59 46	2869	55 32 45	2877	57 5 33	2885	58 38 11	2893
	α Aquilæ	E.	54 20 17	4088	53 10 4	4149	52 0 49	4213	50 52 35	4280
	Fomalhaut	E.	75 7 12	3190	73 40 51	3204	72 14 46	3217	70 48 57	3231
	Mars	E.	90 38 24	2962	89 7 23	2970	87 36 33	2978	86 5 53	2985
	Saturn	E.	93 39 1	2869	92 5 54	2871	90 32 58	2870	89 0 12	2867
22	Spica	W.	66 18 59	2929	67 50 41	2935	69 22 15	2942	70 53 41	2948
	Antares	W.	20 24 30	2927	21 56 14	2936	23 27 49	2941	24 59 16	2946
	Fomalhaut	E.	63 44 17	3311	62 20 18	3328	60 56 39	3346	59 33 21	3366

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Antares	E.	93° 17′ 42″	2106	91° 26′ 55″	2118	89° 36′ 24″	2129	87° 46′ 9″	2140
14	Sun	W.	56 46 44	2509	58 27 45	2523	60 8 26	2538	61 48 47	2551
	Venus	W.	38 14 24	2584	39 53 41	2599	41 32 37	2614	43 11 13	2629
	Spica	E.	32 48 12	2910	31 0 0	2925	29 12 10	2940	27 24 42	2956
	Antares	E.	78 39 22	2902	76 50 57	2916	75 2 53	2929	73 15 9	2943
	Jupiter	E.	96 27 10	2888	94 38 24	2901	92 49 58	2914	91 1 52	2929
15	Sun	W.	70 5 32	2626	71 43 51	2643	73 21 48	2658	74 59 24	2674
	Venus	W.	51 19 3	2707	52 55 33	2723	54 31 42	2739	56 7 30	2756
	Regulus	W.	35 34 54	2314	37 20 33	2329	39 5 50	2344	40 50 46	2359
	Antares	E.	64 21 39	2315	62 36 1	2329	60 50 44	2344	59 5 49	2359
	Jupiter	E.	82 6 37	2300	80 20 38	2315	78 35 1	2331	76 49 46	2346
16	Sun	W.	83 2 7	2753	84 37 36	2769	86 12 45	2785	87 47 33	2800
	Venus	W.	64 1 7	2837	65 34 47	2853	67 8 6	2869	68 41 4	2886
	Regulus	W.	49 30 3	2433	51 12 50	2448	52 55 17	2462	54 37 23	2477
	Antares	E.	50 26 34	2433	48 43 47	2448	47 1 21	2463	45 19 16	2478
	Jupiter	E.	68 8 58	2422	66 25 54	2437	64 43 12	2453	63 0 52	2467
17	Sun	W.	95 36 30	2877	97 9 18	2892	98 41 47	2907	100 13 57	2922
	Venus	W.	76 20 47	2965	77 51 44	2980	79 22 22	2995	80 52 41	3009
	Regulus	W.	63 2 46	2549	64 42 51	2563	66 22 37	2577	68 2 4	2591
	Antares	E.	36 53 58	2550	35 13 54	2564	33 34 9	2577	31 54 43	2591
	Jupiter	E.	54 34 31	2543	52 54 18	2559	51 14 26	2574	49 34 55	2589
18	Sun	W.	107 50 12	2993	109 20 34	3005	110 50 40	3019	112 20 29	3032
	Venus	W.	88 19 43	3082	89 48 15	3096	91 16 29	3110	92 44 27	3123
	Regulus	W.	76 14 44	2655	77 52 23	2668	79 29 46	2681	81 6 52	2693
	Spica	W.	22 17 12	2672	23 54 30	2682	25 31 34	2693	27 8 23	2704
	Antares	E.	23 42 11	2657	22 4 34	2670	20 27 14	2683	18 50 11	2695
	Jupiter	E.	41 22 29	2664	39 45 1	2680	38 7 54	2695	36 31 7	2710
	α Aquilæ	E.	80 8 30	3400	78 46 14	3421	77 24 21	3443	76 2 53	3465
19	Sun	W.	119 45 37	3095	121 13 53	3106	122 41 55	3118	124 9 43	3129
	Venus	W.	100 0 22	3186	101 26 48	3198	102 53 0	3209	104 18 58	3221
	Regulus	W.	89 8 24	2750	90 43 58	2761	92 19 17	2771	93 54 23	2782
	Spica	W.	35 8 53	2757	36 44 17	2767	38 19 28	2778	39 54 25	2788
	Jupiter	E.	28 32 36	2796	26 58 3	2816	25 23 56	2838	23 50 17	2861
	α Aquilæ	E.	69 22 17	3597	68 3 39	3626	66 45 33	3658	65 28 1	3691
20	Spica	W.	47 46 1	2835	49 19 44	2843	50 53 16	2852	52 26 37	2861
	α Aquilæ	E.	59 9 44	3886	57 56 10	3931	56 43 22	3981	55 31 24	4033
21	Spica	W.	60 10 40	2900	61 42 59	2908	63 15 8	2915	64 47 8	2922
	α Aquilæ	E.	49 45 24	4354	48 39 21	4434	47 34 30	4518	46 30 54	4611
	Fomalhaut	E.	69 23 25	3947	67 58 11	3961	66 33 14	3977	65 8 36	3994
	Mars	E.	84 35 22	2993	83 5 1	3001	81 34 49	3008	80 4 46	3015
	Saturn	E.	87 27 36	2894	85 55 9	2901	84 22 52	2909	82 50 44	2916
22	Spica	W.	72 24 59	2954	73 56 9	2961	75 27 11	2966	76 58 6	2972
	Antares	W.	26 30 36	2953	28 1 48	2959	29 32 52	2965	31 3 49	2970
	Fomalhaut	E.	58 10 26	3386	56 47 54	3408	55 25 46	3431	54 4 4	3456

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Mars	E.	78° 34′ 52″	3022	77° 5′ 7″	3029	75° 35′ 30″	3036	74° 6′ 2″	3043
	Saturn	E.	81 18 46	2923	79 46 56	2930	78 15 15	2936	76 43 42	2943
	α Pegasi	E.	85 12 34	3135	83 45 7	3143	82 17 50	3152	80 50 43	3159
23	Spica	W.	78 28 54	2977	79 59 35	2983	81 30 9	2989	83 0 36	2993
	Antares	W.	32 34 39	2976	34 5 22	2981	35 35 58	2986	37 6 28	2992
	Jupiter	W.	16 18 0	3147	17 45 13	3122	19 12 56	3103	20 41 2	3088
	Fomalhaut	E.	52 42 50	3480	51 22 4	3508	50 1 49	3537	48 42 6	3568
	Mars	E.	66 40 41	3074	65 12 0	3080	63 43 26	3086	62 14 59	3092
	Saturn	E.	69 7 57	2973	67 37 10	2979	66 6 31	2984	64 35 58	2989
	α Pegasi	E.	73 37 37	3203	72 11 31	3213	70 45 37	3222	69 19 54	3231
24	Antares	W.	44 37 24	3014	46 7 19	3019	47 37 8	3023	49 6 52	3027
	Jupiter	W.	28 4 38	3058	29 33 39	3056	31 2 43	3054	32 31 49	3054
	Mars	E.	54 54 34	3121	53 26 50	3127	51 59 13	3133	50 31 43	3139
	Saturn	E.	57 4 51	3014	55 34 56	3019	54 5 7	3023	52 35 23	3028
	α Pegasi	E.	62 14 20	3287	60 49 53	3299	59 25 40	3312	58 1 42	3325
25	Antares	W.	56 34 23	3044	58 3 41	3047	59 32 55	3051	61 2 5	3053
	Jupiter	W.	39 57 20	3056	41 26 24	3056	42 55 28	3056	44 24 31	3058
	Mars	E.	43 16 5	3170	41 49 20	3178	40 22 44	3185	38 56 17	3192
	Saturn	E.	45 8 5	3049	43 38 53	3053	42 9 46	3057	40 40 44	3061
	α Pegasi	E.	51 6 1	3405	49 43 50	3424	48 22 1	3445	47 0 35	3467
	α Arietis	E.	91 38 14	3062	90 9 18	3065	88 40 26	3069	87 11 38	3071
26	Antares	W.	68 27 12	3064	69 56 6	3065	71 24 58	3067	72 53 48	3069
	Jupiter	W.	51 49 24	3063	53 18 19	3063	54 47 14	3065	56 16 7	3065
	Mars	E.	31 46 30	3941	30 21 9	3954	28 56 4	3969	27 31 16	3985
	Saturn	E.	33 16 47	3082	31 48 15	3086	30 19 48	3090	28 51 26	3096
	α Arietis	E.	79 48 23	3082	78 19 52	3084	76 51 23	3086	75 22 56	3088
27	Antares	W.	80 17 39	3072	81 46 23	3071	83 15 8	3071	84 43 53	3070
	Jupiter	W.	63 40 28	3065	65 9 20	3065	66 38 13	3065	68 7 6	3064
	α Arietis	E.	68 1 7	3092	66 32 48	3093	65 4 30	3093	63 36 12	3094
	Aldebaran	E.	99 39 24	3148	98 12 13	3148	96 45 2	3148	95 17 50	3147
28	Jupiter	W.	75 31 52	3056	77 0 55	3054	78 30 1	3052	79 59 9	3049
	α Aquilæ	W.	47 38 23	4590	48 40 56	4518	49 44 32	4453	50 49 6	4391
	α Arietis	E.	56 14 40	3091	54 46 19	3090	53 17 57	3088	51 49 33	3087
	Aldebaran	E.	88 1 32	3141	86 34 12	3138	85 6 49	3137	83 39 24	3134
29	α Aquilæ	W.	56 24 38	4143	57 33 58	4102	58 43 58	4064	59 54 35	4029
	α Arietis	E.	44 27 5	3078	42 58 28	3075	41 29 48	3073	40 1 5	3071
	Aldebaran	E.	76 21 34	3120	74 53 49	3118	73 26 1	3114	71 58 8	3110
	Sun	E.	134 24 4	3409	133 1 58	3404	131 39 46	3398	130 17 27	3393
30	α Aquilæ	W.	65 55 56	3874	67 9 42	3847	68 23 56	3821	69 38 36	3797
	Aldebaran	E.	64 37 33	3089	63 9 10	3085	61 40 42	3080	60 12 8	3074
	Sun	E.	123 24 6	3358	122 1 1	3350	120 37 47	3341	119 14 23	3332
31	α Aquilæ	W.	75 57 57	3689	77 14 56	3669	78 32 16	3650	79 49 56	3632
	Aldebaran	E.	52 47 44	3050	51 18 33	3045	49 49 16	3040	48 19 53	3036
	Sun	E.	112 14 41	3282	110 50 9	3270	109 25 23	3259	108 0 24	3247

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
22	Mars	E.	72° 36′ 42″	3049	71° 7′ 30″	3056	69° 38′ 26″	3062	68° 9′ 30″	3068
	Saturn	E.	75 12 18	2949	73 41 1	2955	72 9 52	2962	70 38 51	2967
	α Pegasi	E.	79 23 45	3168	77 56 57	3177	76 30 20	3185	75 3 53	3194
23	Spica	W.	84 30 57	2999	86 1 11	3003	87 31 20	3008	89 1 23	3013
	Antares	W.	38 36 51	2997	40 7 8	3001	41 37 19	3006	43 7 24	3010
	Jupiter	W.	22 9 26	3078	23 38 2	3071	25 6 47	3065	26 35 40	3060
	Fomalhaut	E.	47 22 57	3602	46 4 25	3639	44 46 33	3678	43 29 23	3721
	Mars	E.	60 46 40	3098	59 18 28	3104	57 50 23	3110	56 22 25	3115
	Saturn	E.	63 5 32	2994	61 35 12	3000	60 4 59	3005	58 34 52	3009
	α Pegasi	E.	67 54 22	3242	66 29 2	3253	65 3 55	3264	63 39 1	3275
24	Antares	W.	50 36 31	3030	52 6 6	3034	53 35 36	3038	55 5 2	3042
	Jupiter	W.	34 0 55	3053	35 30 2	3054	36 59 8	3054	38 28 14	3054
	Mars	E.	49 4 21	3145	47 37 6	3151	46 9 58	3158	44 42 58	3163
	Saturn	E.	51 5 45	3032	49 36 12	3036	48 6 44	3041	46 37 22	3045
	α Pegasi	E.	56 37 59	3338	55 14 32	3354	53 51 23	3370	52 28 32	3387
25	Antares	W.	62 31 12	3056	64 0 16	3058	65 29 17	3060	66 58 16	3062
	Jupiter	W.	45 53 32	3059	47 22 32	3060	48 51 30	3061	50 20 27	3061
	Mars	E.	37 29 58	3200	36 3 49	3209	34 37 51	3219	33 12 4	3230
	Saturn	E.	39 11 47	3065	37 42 55	3069	36 14 7	3073	34 45 24	3078
	α Pegasi	E.	45 39 34	3491	44 19 0	3516	42 58 54	3545	41 39 20	3576
	α Arietis	E.	85 42 53	3073	84 14 11	3076	82 45 32	3078	81 16 56	3081
26	Antares	W.	74 22 36	3069	75 51 23	3070	77 20 9	3071	78 48 54	3071
	Jupiter	W.	57 45 0	3065	59 13 52	3065	60 42 44	3065	62 11 36	3065
	Mars	E.	26 6 47	3304	24 42 40	3326	23 18 59	3354	21 55 50	3386
	Saturn	E.	27 23 11	3101	25 55 3	3107	24 27 2	3114	22 59 10	3122
	α Arietis	E.	73 54 32	3089	72 26 9	3090	70 57 47	3091	69 29 27	3091
27	Antares	W.	86 12 39	3070	87 41 25	3069	89 10 13	3068	90 39 2	3066
	Jupiter	W.	69 36 0	3063	71 4 55	3061	72 33 52	3060	74 2 51	3058
	α Arietis	E.	62 7 55	3093	60 39 37	3093	59 11 19	3092	57 43 0	3091
	Aldebaran	E.	93 50 37	3146	92 23 23	3144	90 56 7	3143	89 28 50	3143
28	Jupiter	W.	81 28 21	3047	82 57 36	3043	84 26 55	3039	85 56 19	3036
	α Aquilæ	W.	51 54 35	4335	53 0 55	4282	54 8 4	4233	55 15 59	4186
	α Arietis	E.	50 21 8	3086	48 52 41	3083	47 24 11	3082	45 55 39	3080
	Aldebaran	E.	82 11 56	3133	80 44 26	3129	79 16 52	3127	77 49 15	3124
29	α Aquilæ	W.	61 5 46	3995	62 17 31	3961	63 29 49	3930	64 42 38	3902
	α Arietis	E.	38 32 20	3069	37 3 32	3066	35 34 41	3063	34 5 46	3060
	Aldebaran	E.	70 30 11	3106	69 2 9	3102	67 34 2	3098	66 5 50	3094
	Sun	E.	128 55 2	3386	127 32 30	3379	126 9 50	3372	124 47 2	3365
30	α Aquilæ	W.	70 53 41	3774	72 9 10	3751	73 25 3	3729	74 41 19	3709
	Aldebaran	E.	58 43 27	3070	57 14 41	3065	55 45 48	3060	54 16 49	3055
	Sun	E.	117 50 49	3323	116 27 4	3313	115 3 8	3304	113 39 1	3293
31	α Aquilæ	W.	81 7 56	3615	82 26 14	3598	83 44 51	3581	85 3 46	3565
	Aldebaran	E.	46 50 25	3032	45 20 52	3028	43 51 14	3026	42 21 33	3023
	Sun	E.	106 35 11	3235	105 9 43	3222	103 44 0	3209	102 18 1	3195

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S *Apparent* Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be added to* *subtracted from* *Apparent Time.*	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	8 46 51.08	9.702	N.17 56 54.9	–38.01	15 48.07	66.63	6 2.44	0.154
Thur.	2	8 50 43.63	9.678	17 41 33.5	38.74	15 48.20	66.54	5 58.44	0.178
Frid.	3	8 54 35.58	9.653	17 25 54.6	39.46	15 48.33	66.45	5 53.85	0.203
Sat.	4	8 58 26.94	9.629	17 9 58.8	40.17	15 48.46	66.36	5 48.68	0.227
Sun.	5	9 2 17.72	9.604	16 53 46.2	40.87	15 48.60	66.27	5 42.92	0.252
Mon.	6	9 6 7.92	9.580	16 37 17.0	41.55	15 48.74	66.19	5 36.57	0.276
Tues.	7	9 9 57.54	9.555	16 20 31.6	42.22	15 48.89	66.10	5 29.65	0.300
Wed.	8	9 13 46.58	9.531	16 3 30.4	42.88	15 49.04	66.01	5 22.16	0.324
Thur.	9	9 17 35.04	9.507	15 46 13.6	43.52	15 49.20	65.92	5 14.08	0.348
Frid.	10	9 21 22.92	9.483	15 28 41.7	44.14	15 49.36	65.84	5 5.43	0.372
Sat.	11	9 25 10.21	9.459	15 10 55.0	44.75	15 49.53	65.76	4 56.20	0.396
Sun.	12	9 28 56.93	9.435	14 52 53.7	45.35	15 49.70	65.68	4 46.39	0.420
Mon.	13	9 32 43.08	9.412	14 34 38.2	45.94	15 49.88	65.60	4 36.01	0.443
Tues.	14	9 36 28.67	9.389	14 16 8.9	46.57	15 50.06	65.52	4 25.07	0.466
Wed.	15	9 40 13.72	9.366	13 57 25.9	47.07	15 50.24	65.44	4 13.59	0.489
Thur.	16	9 43 58.23	9.343	13 38 29.7	47.61	15 50.43	65.37	4 1.58	0.512
Frid.	17	9 47 42.20	9.321	13 19 20.7	48.13	15 50.62	65.29	3 49.03	0.534
Sat.	18	9 51 25.64	9.300	12 59 59.1	48.65	15 50.81	65.22	3 35.95	0.555
Sun.	19	9 55 8.57	9.279	12 40 25.4	49.16	15 51.01	65.15	3 22.35	0.576
Mon.	20	9 58 51.00	9.259	12 20 39.6	49.65	15 51.21	65.08	3 8.27	0.596
Tues.	21	10 2 32.95	9.239	12 0 42.2	50.13	15 51 41	65.01	2 53.71	0.616
Wed.	22	10 6 14.44	9.219	11 40 33.4	50.60	15 51.62	64.95	2 38.68	0.635
Thur.	23	10 9 55.47	9.200	11 20 13.5	51.05	15 51.83	64.88	2 23.19	0.654
Frid.	24	10 13 36.07	9.182	10 59 43.0	51.49	15 52.04	64.82	2 7.28	0.672
Sat.	25	10 17 16.25	9.165	10 38 2.0	51.92	15 52.25	64.76	1 50.95	0.689
Sun.	26	10 20 56.03	9.149	10 18 10.7	52.34	15 52.46	64.70	1 34.22	0.705
Mon.	27	10 24 35.44	9.134	9 57 9.6	52.75	15 52.67	64.64	1 17.11	0.720
Tues.	28	10 28 14.49	9.120	9 35 59.0	53.14	15 52.89	64.59	0 59.66	0.734
Wed.	29	10 31 53.20	9.108	9 14 39.1	53.52	15 53.10	64.54	0 41.87	0.748
Thur.	30	10 35 31.58	9.092	8 53 10.1	53.89	15 53.32	64.49	0 23.75	0.762
Frid.	31	10 39 9.65	9.079	8 31 32.4	54.25	15 53.54	64.44	0 5.32	0.775
Sat.	32	10 42 47.42	9.067	N. 8 9 46.3	–54.59	15 53.77	64.40	0 13.42	0.787

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.18$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	Equation of Time, *to be subtracted from* / *added to* *Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	8 46 50.10	9.702	N.17 56 58.7	−38.01	6 2.46	0.154	8 40 47.64
Thur.	2	8 50 42.66	9.678	17 41 37.3	38.74	5 58.47	0.178	8 44 44.19
Frid.	3	8 54 34.62	9.653	17 25 58.5	39.46	5 53.87	0.203	8 48 40.75
Sat.	4	8 58 26.00	9.629	17 10 2.7	40.17	5 48.70	0.227	8 52 37.30
Sun.	5	9 2 16.80	9.604	16 53 50.1	40.87	5 42.94	0.252	8 56 33.86
Mon.	6	9 6 7.02	9.580	16 37 20.9	41.55	5 36.60	0.276	9 0 30.42
Tues.	7	9 9 56.66	9.556	16 20 35.5	42.22	5 29.68	0.300	9 4 26.98
Wed.	8	9 13 45.72	9.532	16 3 34.2	42.88	5 22.19	0.324	9 8 23.53
Thur.	9	9 17 34.20	9.508	15 46 17.4	43.52	5 14.11	0.348	9 12 20.09
Frid.	10	9 21 22.10	9.484	15 28 45.5	44.14	5 5.46	0.372	9 16 16.64
Sat.	11	9 25 9.42	9.460	15 10 58.7	44.75	4 56.22	0.396	9 20 13.20
Sun.	12	9 28 56.17	9.436	14 52 57.3	45.35	4 46.42	0.420	9 24 9.75
Mon.	13	9 32 42.35	9.413	14 34 41.7	45.94	4 36.04	0.443	9 28 6.31
Tues.	14	9 36 27.97	9.390	14 16 12.3	46.51	4 25.10	0.466	9 32 2.87
Wed.	15	9 40 13.05	9.367	13 57 29.3	47.07	4 13.62	0.489	9 35 59.43
Thur.	16	9 43 57.59	9.344	13 38 33.0	47.61	4 1.61	0.512	9 39 55.98
Frid.	17	9 47 41.60	9.322	13 19 23.8	48.14	3 49.07	0.534	9 43 52.53
Sat.	18	9 51 25.07	9.301	13 0 2.1	48.66	3 35.98	0.555	9 47 49.09
Sun.	19	9 55 8.03	9.280	12 40 28.2	49.17	3 22.38	0.576	9 51 45.65
Mon.	20	9 58 50.50	9.260	12 20 42.2	49.66	3 8.30	0.596	9 55 42.20
Tues.	21	10 2 32.49	9.240	12 0 44.7	50.14	2 53.73	0.616	9 59 38.76
Wed.	22	10 6 14.02	9.221	11 40 35.7	50.61	2 38.71	0.635	10 3 35.31
Thur.	23	10 9 55.09	9.202	11 20 15.6	51.06	2 23.22	0.654	10 7 31.87
Frid.	24	10 13 35.73	9.184	10 59 44.9	51.50	2 7.31	0.672	10 11 28.42
Sat.	25	10 17 15.95	9.167	10 39 3.7	51.93	1 50.97	0.689	10 15 24.98
Sun.	26	10 20 55.77	9.151	10 18 12.2	52.35	1 34.24	0.705	10 19 21.53
Mon.	27	10 24 35.22	9.136	9 57 10.9	52.76	1 17.13	0.720	10 23 18.09
Tues.	28	10 28 14.32	9.122	9 36 0.0	53.15	0 59.68	0.734	10 27 14.64
Wed.	29	10 31 53.07	9.108	9 14 39.8	53.53	0 41.88	0.748	10 31 11.19
Thur.	30	10 35 31.50	9.094	8 53 10.5	53.90	0 23.76	0.762	10 35 7.74
Frid.	31	10 39 9.62	9.081	8 31 32.6	54.26	0 5.32	0.775	10 39 4.30
Sat.	32	10 42 47.43	9.069	N. 8 9 46.3	−54.60	0 13.42	0.787	10 43 0.85

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^{s}.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	213	129 16 28.2	15 49.8	143.57	+0.65	0.0063332	−23.3	15 16 41.77
2	214	130 13 54.6	13 16.1	143.62	0.70	.0062764	24.0	15 12 45.86
3	215	131 11 22.2	10 43.6	143.67	0.70	.0062177	24.9	15 8 49.96
4	216	132 8 51.1	8 12.3	143.73	0.69	.0061569	25.8	15 4 54.05
5	217	133 6 21.2	5 42.2	143.78	0.64	.0060939	26.7	15 0 58.14
6	218	134 3 52.6	3 13.4	143.83	0.56	.0060287	27.6	14 57 2.23
7	219	135 1 25.2	0 45.9	143.88	0.46	.0059614	28.5	14 53 6.31
8	220	135 58 58.9	58 19.5	143.93	0.34	.0058919	29.4	14 49 10.40
9	221	136 56 33.8	55 54.2	143.98	0.21	.0058201	30.3	14 45 14.49
10	222	137 54 9.9	53 30.1	144.02	+0.08	.0057460	31.3	14 41 18.58
11	223	138 51 47.2	51 7.2	144.07	−0.06	.0056696	32.2	14 37 22.67
12	224	139 49 25.5	48 45.5	144.11	0.19	.0055910	33.1	14 33 26.76
13	225	140 47 4.9	46 24.8	144.16	0.30	.0055103	34.0	14 29 30.85
14	226	141 44 45.3	44 5.0	144.20	0.40	.0054276	34.8	14 25 34.94
15	227	142 42 26.7	41 46.2	144.25	0.46	.0053431	35.6	14 21 39.03
16	228	143 40 9.2	39 28.6	144.29	0.50	.0052568	36.3	14 17 43.12
17	229	144 37 52.7	37 12.0	144.34	0.51	.0051690	36.9	14 13 47.21
18	230	145 35 37.4	34 56.6	144.38	0.48	.0050798	37.4	14 9 51.30
19	231	146 33 23.2	32 42.2	144.43	0.42	.0049893	37.9	14 5 55.39
20	232	147 31 10.2	30 29.0	144.48	0.36	.0048977	38.4	14 1 59.48
21	233	148 28 58.4	28 17.1	144.53	0.25	.0048051	38.8	13 58 3.57
22	234	149 26 47.9	26 6.5	144.59	0.15	.0047115	39.2	13 54 7.66
23	235	150 24 38.8	23 57.3	144.65	−0.03	.0046171	39.5	13 50 11.75
24	236	151 22 31.2	21 49.6	144.71	+0.10	.0045221	39.8	13 46 15.84
25	237	152 20 25.1	19 43.4	144.78	0.24	.0044263	40.1	13 42 19.93
26	238	153 18 20.6	17 38.8	144.85	0.35	.0043297	40.3	13 38 24.02
27	239	154 16 17.9	15 35.9	144.92	0.46	.0042323	40.6	13 34 28.12
28	240	155 14 16.9	13 34.8	145.00	0.51	.0041340	41.0	13 30 32.21
29	241	156 12 17.8	11 35.6	145.08	0.57	.0040348	41.5	13 26 36.30
30	242	157 10 20.6	9 38.3	145.16	0.58	.0039347	42.0	13 22 40.40
31	243	158 8 25.4	7 43.0	145.24	0.57	.0038336	42.4	13 18 44.49
32	244	159 6 32.2	5 49.7	145.32	−0.53	0.0037312	−42.9	13 14 48.57

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0.d.

Diff. for 1 hour.
$-9^{s}.8296$

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 12.3	15 18.0	55 41.3	+1.70	56 2.7	+1.86	17 30.6	1.98	21.6
2	15 24.4	15 31.2	56 25.9	2.01	56 50.9	2.15	18 20.5	2.19	22.6
3	15 38.4	15 45.9	57 17.3	2.26	57 44.9	2.33	19 15.7	2.41	23.6
4	15 53.6	16 1.4	58 13.2	2.38	58 41.8	2.37	20 15.8	2.60	24.6
5	16 9.0	16 16.4	59 9.9	2.31	59 36.9	2.19	21 19.3	2.67	25.6
6	16 23.3	16 29.5	60 2.3	2.02	60 25.2	1.78	22 23.3	2.63	26.6
7	16 34.9	16 39.3	60 44.9	1.50	61 0.8	1.16	23 25.1	2.50	27.6
8	16 42.4	16 44.3	61 12.5	+0.78	61 19.4	+0.37	6		28.6
9	16 44.9	16 44.0	61 21.4	−0.05	61 18.3	−0.46	0 23.1	2.33	0.3
10	16 41.9	16 38.5	61 10.4	0.86	60 57.9	1.22	1 17.3	2.19	1.3
11	16 34.0	16 28.4	60 41.3	1.54	60 21.1	1.81	2 8.5	2.09	2.3
12	16 22.2	16 15.3	59 58.1	2.02	59 32.9	2.18	2 58.1	2.05	3.3
13	16 8.0	16 0.5	59 6.1	2.27	58 38.5	2.31	3 47.3	2.06	4.3
14	15 53.0	15 45.5	58 10.9	2.30	57 43.6	2.25	4 37.4	2.11	5.3
15	15 38.3	15 31.4	57 17.0	2.17	56 51.6	2.06	5 28.9	2.18	6.3
16	15 24.9	15 18.8	56 27.6	1.93	56 5.3	1.78	6 22.0	2.24	7.3
17	15 13.2	15 8.1	55 44.8	1.63	55 26.2	1.48	7 16.0	2.26	8.3
18	15 3.6	14 59.5	55 9.4	1.32	54 54.6	1.16	8 9.8	2.22	9.3
19	14 56.0	14 53.0	54 41.6	1.00	54 30.5	0.85	9 2.1	2.13	10.3
20	14 50.5	14 48.4	54 21.2	0.70	54 13.6	0.56	9 51.8	2.01	11.3
21	14 46.8	14 45.6	54 7.7	0.43	54 3.3	0.30	10 38.5	1.88	12.3
22	14 44.8	14 44.4	54 0.4	−0.18	53 58.9	−0.07	11 22.3	1.77	13.3
23	14 44.3	14 44.7	53 58.7	+0.04	53 59.9	+0.15	12 3.8	1.69	14.3
24	14 45.3	14 46.3	54 2.3	0.25	54 6.0	0.36	12 43.8	1.64	15.3
25	14 47.7	14 49.4	54 11.0	0.48	54 17.4	0.59	13 23.1	1.64	16.3
26	14 51.5	14 54.0	54 25.1	0.70	54 34.3	0.83	14 2.7	1.67	17.3
27	14 57.0	15 0.3	54 45.0	0.96	54 57.3	1.09	14 43.8	1.76	18.3
28	15 4.0	15 8.3	55 11.2	1.22	55 26.7	1.36	15 27.6	1.90	19.3
29	15 12.9	15 18.0	55 43.9	1.50	56 2.7	1.63	16 15.0	2.07	20.3
30	15 23.6	15 29.6	56 23.1	1.76	56 45.0	1.89	17 6.7	2.26	21.3
31	15 36.0	15 42.6	57 8.3	2.00	57 32.8	2.08	18 3.2	2.44	22.3
32	15 49.5	15 56.5	57 58.1	+2.14	58 24.0	+2.17	19 3.4	2.56	23.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 38 56.13	1.9651	N.15 0 32.7	12.767
1	1 40 54.21	1.9709	15 13 17.2	12.716
2	1 42 52.64	1.9768	15 25 58.6	12.664
3	1 44 51.43	1.9828	15 38 36.9	12.611
4	1 46 50.58	1.9890	15 51 11.9	12.556
5	1 48 50.11	1.9952	16 3 43.6	12.500
6	1 50 50.01	2.0015	16 16 11.9	12.443
7	1 52 50.29	2.0078	16 28 36.8	12.385
8	1 54 50.95	2.0142	16 40 58.1	12.325
9	1 56 52.00	2.0207	16 53 15.8	12.264
10	1 58 53.44	2.0273	17 5 29.8	12.202
11	2 0 55.28	2.0340	17 17 40.1	12.140
12	2 2 57.52	2.0407	17 29 46.6	12.076
13	2 5 0.17	2.0475	17 41 49.2	12.010
14	2 7 3.22	2.0543	17 53 47.8	11.943
15	2 9 6.68	2.0612	18 5 42.4	11.876
16	2 11 10.56	2.0682	18 17 32.9	11.806
17	2 13 14.87	2.0753	18 29 19.1	11.734
18	2 15 19.60	2.0824	18 41 1.0	11.662
19	2 17 24.76	2.0896	18 52 38.6	11.589
20	2 19 30.35	2.0962	19 4 11.7	11.514
21	2 21 36.38	2.1042	19 15 40.3	11.438
22	2 23 42.85	2.1116	19 27 4.3	11.360
23	2 25 49.77	2.1191	N.19 38 23.5	11.281

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 27 57.14	2.1266	N.19 49 38.0	11.202
1	2 30 4.96	2.1341	20 0 47.7	11.120
2	2 32 13.23	2.1417	20 11 52.4	11.036
3	2 34 21.96	2.1493	20 22 52.0	10.951
4	2 36 31.15	2.1571	20 33 46.5	10.865
5	2 38 40.81	2.1649	20 44 35.8	10.777
6	2 40 50.94	2.1727	20 55 19.8	10.688
7	2 43 1.54	2.1806	21 5 58.4	10.598
8	2 45 12.61	2.1884	21 16 31.5	10.506
9	2 47 24.15	2.1963	21 26 59.1	10.412
10	2 49 36.17	2.2044	21 37 21.0	10.317
11	2 51 48.68	2.2126	21 47 37.2	10.221
12	2 54 1.68	2.2207	21 57 47.5	10.122
13	2 56 15.16	2.2287	22 7 51.9	10.022
14	2 58 29.13	2.2368	22 17 50.2	9.921
15	3 0 43.58	2.2450	22 27 42.4	9.818
16	3 2 58.53	2.2533	22 37 28.4	9.713
17	3 5 13.98	2.2616	22 47 8.0	9.607
18	3 7 29.92	2.2698	22 56 41.2	9.499
19	3 9 46.36	2.2782	23 6 7.9	9.390
20	3 12 3.30	2.2865	23 15 28.0	9.278
21	3 14 20.74	2.2948	23 24 41.3	9.165
22	3 16 38.68	2.3032	23 33 47.8	9.051
23	3 18 57.12	2.3116	23 42 47.4	9.936
24	3 21 16.07	2.3200	N.23 51 40.1	8.819

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 21 16.07	2.3200	N.23 51 40.1	8.819
1	3 23 35.52	2.3283	24 0 25.7	8.699
2	3 25 55.47	2.3367	24 9 4.0	8.578
3	3 28 15.93	2.3452	24 17 35.0	8.455
4	3 30 36.89	2.3536	24 25 58.6	8.331
5	3 32 58.36	2.3620	24 34 14.7	8.204
6	3 35 20.33	2.3703	24 42 23.1	8.076
7	3 37 42.80	2.3787	24 50 23.8	7.947
8	3 40 5.77	2.3871	24 58 16.7	7.816
9	3 42 29.25	2.3955	25 6 1.7	7.683
10	3 44 53.23	2.4038	25 13 38.7	7.549
11	3 47 17.70	2.4120	25 21 7.6	7.412
12	3 49 42.67	2.4203	25 28 28.2	7.274
13	3 52 8.14	2.4286	25 35 40.5	7.135
14	3 54 34.10	2.4368	25 42 44.4	6.993
15	3 57 0.55	2.4449	25 49 39.7	6.850
16	3 59 27.49	2.4530	25 56 26.4	6.706
17	4 1 54.91	2.4611	26 3 4.4	6.559
18	4 4 22.82	2.4692	26 9 33.5	6.411
19	4 6 51.21	2.4771	26 15 53.7	6.262
20	4 9 20.07	2.4850	26 22 4.9	6.110
21	4 11 49.41	2.4929	26 28 6.9	5.957
22	4 14 19.22	2.5007	26 33 59.7	5.802
23	4 16 49.49	2.5084	N.26 39 43.2	5.646

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 19 20.23	2.5161	N.26 45 17.2	5.487
1	4 21 51.42	2.5237	26 50 41.7	5.328
2	4 24 23.07	2.5312	26 55 56.6	5.167
3	4 26 55.16	2.5385	27 1 1.7	5.004
4	4 29 27.69	2.5458	27 5 57.0	4.840
5	4 32 0.66	2.5531	27 10 42.5	4.674
6	4 34 34.06	2.5602	27 15 17.9	4.506
7	4 37 7.88	2.5672	27 19 43.2	4.337
8	4 39 42.12	2.5742	27 23 58.3	4.167
9	4 42 16.78	2.5810	27 28 3.2	3.995
10	4 44 51.84	2.5877	27 31 57.7	3.821
11	4 47 27.30	2.5943	27 35 41.7	3.646
12	4 50 3.16	2.6008	27 39 15.2	3.470
13	4 52 39.40	2.6072	27 42 38.1	3.292
14	4 55 16.02	2.6133	27 45 50.2	3.112
15	4 57 53.00	2.6194	27 48 51.5	2.932
16	5 0 30.35	2.6254	27 51 42.0	2.750
17	5 3 8.05	2.6313	27 54 21.5	2.566
18	5 5 46.10	2.6370	27 56 49.9	2.381
19	5 8 24.49	2.6425	27 59 7.2	2.196
20	5 11 3.20	2.6478	28 1 13.4	2.009
21	5 13 42.23	2.6531	28 3 8.3	1.821
22	5 16 21.57	2.6582	28 4 51.9	1.632
23	5 19 1.22	2.6632	28 6 24.1	1.441
24	5 21 41.16	2.6680	N.28 7 44.8	1.249

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 21 41.16	2.6680	N.28 7 44.8	1.249
1	5 24 21.38	2.6726	28 8 54.0	1.057
2	5 27 1.87	2.6770	28 9 51.6	0.863
3	5 29 42.62	2.6812	28 10 37.5	0.668
4	5 32 23.62	2.6854	28 11 11.7	0.473
5	5 35 4.87	2.6894	28 11 34.2	0.276
6	5 37 46.35	2.6932	28 11 44.8	+0.078
7	5 40 28.05	2.6967	28 11 43.5	−0.120
8	5 43 9.96	2.7001	28 11 30.4	0.318
9	5 45 52.06	2.7033	28 11 5.4	0.517
10	5 48 34.35	2.7063	28 10 28.4	0.717
11	5 51 16.82	2.7092	28 9 39.3	0.919
12	5 53 59.45	2.7118	28 8 38.1	1.121
13	5 56 42.24	2.7143	28 7 24.8	1.322
14	5 59 25.17	2.7167	28 5 59.4	1.524
15	6 2 8.24	2.7188	28 4 21.9	1.727
16	6 4 51.43	2.7207	28 2 32.2	1.930
17	6 7 34.72	2.7223	28 0 30.3	2.134
18	6 10 18.11	2.7239	27 58 16.1	2.338
19	6 13 1.59	2.7252	27 55 49.7	2.542
20	6 15 45.14	2.7264	27 53 11.0	2.747
21	6 18 28.76	2.7274	27 50 20.0	2.952
22	6 21 12.43	2.7281	27 47 16.8	3.156
23	6 23 56.13	2.7286	N.27 44 1.3	3.362

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 26 39.86	2.7290	N.27 40 33.4	3.567
1	6 29 23.61	2.7292	27 36 53.2	3.772
2	6 32 7.36	2.7292	27 33 0.8	3.976
3	6 34 51.11	2.7290	27 28 56.1	4.181
4	6 37 34.84	2.7286	27 24 39.1	4.385
5	6 40 18.54	2.7281	27 20 9.9	4.589
6	6 43 2.21	2.7273	27 15 28.4	4.793
7	6 45 45.82	2.7263	27 10 34.7	4.997
8	6 48 29.37	2.7252	27 5 28.8	5.200
9	6 51 12.84	2.7238	27 0 10.7	5.402
10	6 53 56.23	2.7224	26 54 40.5	5.604
11	6 56 39.53	2.7208	26 48 58.2	5.806
12	6 59 22.72	2.7189	26 43 3.8	6.007
13	7 2 5.80	2.7169	26 36 57.3	6.207
14	7 4 48.75	2.7147	26 30 38.9	6.407
15	7 7 31.56	2.7123	26 24 8.5	6.606
16	7 10 14.22	2.7098	26 17 26.2	6.804
17	7 12 56.73	2.7071	26 10 32.0	7.002
18	7 15 39.07	2.7042	26 3 26.0	7.198
19	7 18 21.23	2.7012	25 56 8.2	7.393
20	7 21 3.21	2.6981	25 48 38.8	7.587
21	7 23 45.00	2.6948	25 40 57.8	7.780
22	7 26 26.58	2.6913	25 33 5.2	7.973
23	7 29 7.95	2.6877	25 25 1.0	8.165
24	7 31 49.10	2.6839	N.25 16 45.4	8.355

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 31 49.10	2.6839	N.25 16 45.4	8.355
1	7 34 30.02	2.6800	25 8 18.4	8.544
2	7 37 10.70	2.6760	24 59 40.1	8.731
3	7 39 51.14	2.6718	24 50 50.7	8.917
4	7 42 31.32	2.6675	24 41 50.1	9.102
5	7 45 11.24	2.6632	24 32 38.4	9.285
6	7 47 50.90	2.6587	24 23 15.8	9.467
7	7 50 30.28	2.6540	24 13 42.3	9.648
8	7 53 9.38	2.6492	24 3 58.0	9.827
9	7 55 48.19	2.6443	23 54 3.0	10.005
10	7 58 26.70	2.6394	23 43 57.4	10.181
11	8 1 4.92	2.6344	23 33 41.3	10.356
12	8 3 42.83	2.6292	23 23 14.7	10.529
13	8 6 20.43	2.6240	23 12 37.8	10.700
14	8 8 57.71	2.6186	23 1 50.7	10.869
15	8 11 34.66	2.6131	22 50 53.5	11.037
16	8 14 11.28	2.6077	22 39 46.3	11.203
17	8 16 47.58	2.6022	22 28 29.2	11.368
18	8 19 23.54	2.5965	22 17 2.2	11.531
19	8 21 59.16	2.5908	22 5 25.5	11.691
20	8 24 34.43	2.5850	21 53 39.3	11.848
21	8 27 9.36	2.5792	21 41 43.7	12.004
22	8 29 43.93	2.5733	21 29 38.8	12.159
23	8 32 18.15	2.5673	N.21 17 24.6	12.312

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 34 52.01	2.5613	N.21 5 1.3	12.463
1	8 37 25.51	2.5553	20 52 29.0	12.612
2	8 39 58.64	2.5492	20 39 47.9	12.758
3	8 42 31.41	2.5431	20 26 58.0	12.904
4	8 45 3.81	2.5369	20 13 59.4	13.047
5	8 47 35.84	2.5308	20 0 52.4	13.187
6	8 50 7.50	2.5246	19 47 37.0	13.326
7	8 52 38.79	2.5183	19 34 13.3	13.462
8	8 55 9.70	2.5121	19 20 41.5	13.596
9	8 57 40.24	2.5058	19 7 1.8	13.727
10	9 0 10.40	2.4995	18 53 14.2	13.857
11	9 2 40.18	2.4932	18 39 18.9	13.986
12	9 5 9.59	2.4870	18 25 15.9	14.112
13	9 7 38.62	2.4807	18 11 5.4	14.235
14	9 10 7.27	2.4744	17 56 47.7	14.355
15	9 12 35.55	2.4682	17 42 22.8	14.474
16	9 15 3.45	2.4619	17 27 50.8	14.591
17	9 17 30.98	2.4557	17 13 11.9	14.706
18	9 19 58.13	2.4494	16 58 26.1	14.819
19	9 22 24.91	2.4432	16 43 33.6	14.928
20	9 24 51.31	2.4369	16 28 34.7	15.035
21	9 27 17.34	2.4307	16 13 29.4	15.141
22	9 29 43.00	2.4246	15 58 17.8	15.244
23	9 32 8.29	2.4185	15 43 0.1	15.344
24	9 34 33.22	2.4124	N.15 27 36.5	15.442

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 34 33.22	2.4124	N.15 27 36.5	15.442
1	9 36 57.78	2.4063	15 12 7.0	15.539
2	9 39 21.98	2.4003	14 56 31.8	15.633
3	9 41 45.82	2.3943	14 40 51.0	15.726
4	9 44 9.30	2.3883	14 25 4.7	15.815
5	9 46 32.42	2.3824	14 9 13.2	15.902
6	9 48 55.19	2.3766	13 53 16.5	15.987
7	9 51 17.61	2.3708	13 37 14.8	16.069
8	9 53 39.69	2.3651	13 21 8.2	16.150
9	9 56 1.42	2.3593	13 4 56.8	16.228
10	9 58 22.81	2.3537	12 48 40.8	16.304
11	10 0 43.86	2.3480	12 32 20.3	16.377
12	10 3 4.57	2.3424	12 15 55.5	16.448
13	10 5 24.95	2.3370	11 59 26.5	16.517
14	10 7 45.01	2.3316	11 42 53.4	16.584
15	10 10 4.74	2.3262	11 26 16.4	16.648
16	10 12 24.15	2.3209	11 9 35.6	16.711
17	10 14 43.25	2.3157	10 52 51.1	16.771
18	10 17 2.03	2.3104	10 36 3.1	16.828
19	10 19 20.50	2.3053	10 19 11.7	16.883
20	10 21 38.67	2.3003	10 2 17.1	16.937
21	10 23 56.54	2.2953	9 45 19.3	16.988
22	10 26 14.11	2.2904	9 28 18.5	17.037
23	10 28 31.39	2.2856	N. 9 11 14.8	17.084

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 30 48.38	2.2808	N. 8 54 8.4	17.128
1	10 33 5.09	2.2762	8 36 59.4	17.171
2	10 35 21.52	2.2715	8 19 47.9	17.212
3	10 37 37.67	2.2669	8 2 34.0	17.250
4	10 39 53.55	2.2625	7 45 17.9	17.285
5	10 42 9.17	2.2582	7 27 59.8	17.318
6	10 44 24.53	2.2538	7 10 39.7	17.351
7	10 46 39.63	2.2496	6 53 17.7	17.381
8	10 48 54.48	2.2455	6 35 54.0	17.407
9	10 51 9.09	2.2415	6 18 28.8	17.432
10	10 53 23.46	2.2375	6 1 2.1	17.456
11	10 55 37.59	2.2336	5 43 34.1	17.478
12	10 57 51.49	2.2298	5 26 4.8	17.497
13	11 0 5.16	2.2260	5 8 34.5	17.513
14	11 2 18.61	2.2224	4 51 3.2	17.529
15	11 4 31.85	2.2189	4 33 31.0	17.542
16	11 6 44.88	2.2154	4 15 58.1	17.553
17	11 8 57.70	2.2119	3 58 24.6	17.562
18	11 11 10.31	2.2085	3 40 50.6	17.570
19	11 13 22.72	2.2053	3 23 16.2	17.575
20	11 15 34.95	2.2023	3 5 41.6	17.577
21	11 17 47.00	2.1993	2 48 6.9	17.579
22	11 19 58.87	2.1963	2 30 32.1	17.579
23	11 22 10.56	2.1934	2 12 57.4	17.577
24	11 24 22.08	2.1907	N. 1 55 22.9	17.572

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 24 22.08	2.1907	N. 1 55 22.9	17.573
1	11 26 33.44	2.1880	1 37 48.7	17.566
2	11 28 44.64	2.1853	1 20 15.0	17.557
3	11 30 55.68	2.1827	1 2 41.8	17.547
4	11 33 6.57	2.1803	0 45 9.3	17.536
5	11 35 17.32	2.1780	0 27 37.5	17.522
6	11 37 27.93	2.1757	N. 0 10 6.6	17.507
7	11 39 38.40	2.1735	S. 0 7 23.3	17.489
8	11 41 48.75	2.1715	0 24 52.1	17.470
9	11 43 58.98	2.1695	0 42 19.7	17.449
10	11 46 9.09	2.1675	0 59 46.0	17.427
11	11 48 19.08	2.1656	1 17 10.9	17.403
12	11 50 28.96	2.1638	1 34 34.3	17.377
13	11 52 38.74	2.1622	1 51 56.1	17.348
14	11 54 48.43	2.1607	2 9 16.1	17.318
15	11 56 58.02	2.1591	2 26 34.3	17.287
16	11 59 7.52	2.1577	2 43 50.6	17.255
17	12 1 16.94	2.1564	3 1 4.9	17.221
18	12 3 26.29	2.1552	3 18 17.1	17.185
19	12 5 35.56	2.1540	3 35 27.1	17.147
20	12 7 44.77	2.1529	3 52 34.8	17.107
21	12 9 53.91	2.1518	4 9 40.0	17.066
22	12 12 2.99	2.1509	4 26 42.7	17.024
23	12 14 12.02	2.1501	S. 4 43 42.9	16.980

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 16 21.01	2.1494	S. 5 0 40.3	16.934
1	12 18 29.95	2.1488	5 17 34.9	16.887
2	12 20 38.86	2.1482	5 34 26.7	16.838
3	12 22 47.73	2.1476	5 51 15.5	16.787
4	12 24 56.57	2.1472	6 8 1.2	16.736
5	12 27 5.39	2.1468	6 24 43.8	16.683
6	12 29 14.19	2.1466	6 41 23.2	16.629
7	12 31 22.98	2.1464	6 57 59.3	16.572
8	12 33 31.76	2.1463	7 14 31.9	16.514
9	12 35 40.53	2.1462	7 31 1.0	16.455
10	12 37 49.30	2.1462	7 47 26.5	16.394
11	12 39 58.08	2.1463	8 3 48.3	16.332
12	12 42 6.86	2.1465	8 20 6.4	16.269
13	12 44 15.66	2.1468	8 36 20.6	16.204
14	12 46 24.48	2.1471	8 52 30.9	16.138
15	12 48 33.31	2.1474	9 8 37.2	16.071
16	12 50 42.17	2.1479	9 24 39.4	16.002
17	12 52 51.06	2.1485	9 40 37.4	15.932
18	12 54 59.99	2.1492	9 56 31.2	15.861
19	12 57 8.96	2.1498	10 12 20.7	15.787
20	12 59 17.97	2.1505	10 28 5.7	15.712
21	13 1 27.02	2.1513	10 43 46.2	15.637
22	13 3 36.13	2.1522	10 59 22.1	15.560
23	13 5 45.29	2.1532	11 14 53.4	15.482
24	13 7 54.51	2.1542	S. 11 30 20.0	15.403

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 7 54.51	2.1542	S. 11 30 20.0	15.403	0	14 53 24.44	2.2543	S. 21 56 43.6	10.309
1	13 10 3.79	2.1552	11 45 41.8	15.322	1	14 55 39.77	2.2568	22 6 58.3	10.180
2	13 12 13.14	2.1563	12 0 58.7	15.240	2	14 57 55.25	2.2593	22 17 5.2	10.050
3	13 14 22.55	2.1575	12 16 10.6	15.157	3	15 0 10.89	2.2619	22 27 4.3	9.920
4	13 16 32.04	2.1588	12 31 17.5	15.073	4	15 2 26.68	2.2644	22 36 55.6	9.789
5	13 18 41.61	2.1602	12 46 19.4	14.988	5	15 4 42.62	2.2669	22 46 39.0	9.657
6	13 20 51.26	2.1615	13 1 16.1	14.902	6	15 6 58.71	2.2694	22 56 14.5	9.525
7	13 23 0.99	2.1629	13 16 7.6	14.813	7	15 9 14.95	2.2719	23 5 42.0	9.392
8	13 25 10.81	2.1644	13 30 53.7	14.723	8	15 11 31.34	2.2744	23 15 1.5	9.258
9	13 27 20.72	2.1659	13 45 34.4	14.633	9	15 13 47.88	2.2769	23 24 13.0	9.124
10	13 29 30.72	2.1675	14 0 9.7	14.542	10	15 16 4.57	2.2793	23 33 16.4	8.988
11	13 31 40.82	2.1692	14 14 39.5	14.450	11	15 18 21.40	2.2817	23 42 11.6	8.852
12	13 33 51.02	2.1708	14 29 3.7	14.357	12	15 20 38.37	2.2841	23 50 58.6	8.716
13	13 36 1.32	2.1726	14 43 22.3	14.262	13	15 22 55.49	2.2865	23 59 37.5	8.579
14	13 38 11.73	2.1744	14 57 35.1	14.165	14	15 25 12.75	2.2888	24 8 8.1	8.441
15	13 40 22.25	2.1762	15 11 42.1	14.068	15	15 27 30.14	2.2910	24 16 30.4	8.302
16	13 42 32.88	2.1781	15 25 43.3	13.970	16	15 29 47.67	2.2933	24 24 44.4	8.164
17	13 44 43.62	2.1800	15 39 38.5	13.870	17	15 32 5.34	2.2956	24 32 50.1	8.025
18	13 46 54.48	2.1820	15 53 27.7	13.770	18	15 34 23.14	2.2978	24 40 47.4	7.885
19	13 49 5.46	2.1840	16 7 10.9	13.669	19	15 36 41.07	2.2999	24 48 36.3	7.744
20	13 51 16.56	2.1861	16 20 48.0	13.567	20	15 38 59.13	2.3020	24 56 16.7	7.602
21	13 53 27.79	2.1882	16 34 18.9	13.463	21	15 41 17.31	2.3041	25 3 48.6	7.461
22	13 55 39.15	2.1904	16 47 43.6	13.359	22	15 43 35.62	2.3061	25 11 12.0	7.319
23	13 57 50.64	2.1925	S. 17 1 2.0	13.253	23	15 45 54.04	2.3080	S. 25 18 26.9	7.177
	TUESDAY 14.					THURSDAY 16.			
0	14 0 2.25	2.1947	S. 17 14 14.0	13.147	0	15 48 12.58	2.3099	S. 25 25 33.2	7.033
1	14 2 14.00	2.1969	17 27 19.6	13.039	1	15 50 31.23	2.3118	25 32 30.9	6.890
2	14 4 25.88	2.1992	17 40 18.7	12.931	2	15 52 50.00	2.3137	25 39 20.0	6.746
3	14 6 37.90	2.2015	17 53 11.3	12.822	3	15 55 8.88	2.3155	25 46 0.4	6.602
4	14 8 50.06	2.2038	18 5 57.3	12.711	4	15 57 27.86	2.3172	25 52 32.2	6.457
5	14 11 2.36	2.2062	18 18 36.6	12.598	5	15 59 46.94	2.3189	25 58 55.2	6.311
6	14 13 14.81	2.2087	18 31 9.1	12.485	6	16 2 6.13	2.3206	26 5 9.5	6.165
7	14 15 27.40	2.2110	18 43 34.8	12.372	7	16 4 25.41	2.3221	26 11 15.0	6.019
8	14 17 40.13	2.2134	18 55 53.8	12.259	8	16 6 44.78	2.3236	26 17 11.8	5.873
9	14 19 53.01	2.2159	19 8 5.9	12.143	9	16 9 4.24	2.3250	26 22 59.8	5.727
10	14 22 6.04	2.2184	19 20 11.0	12.027	10	16 11 23.78	2.3263	26 28 39.0	5.579
11	14 24 19.22	2.2209	19 32 9.1	11.910	11	16 13 43.40	2.3277	26 34 9.3	5.432
12	14 26 32.55	2.2234	19 44 0.2	11.792	12	16 16 3.10	2.3289	26 39 30.8	5.284
13	14 28 46.03	2.2259	19 55 44.2	11 673	13	16 18 22.87	2.3301	26 44 43.4	5.136
14	14 30 59.66	2.2285	20 7 21.0	11.553	14	16 20 42.71	2.3312	26 49 47.1	4.988
15	14 33 13.45	2.2311	20 18 50.5	11.432	15	16 23 2.61	2.3322	26 54 42.0	4.841
16	14 35 27.39	2.2336	20 30 12.8	11.311	16	16 25 22.57	2.3332	26 59 28.0	4.692
17	14 37 41.48	2.2361	20 41 27.8	11.188	17	16 27 42.59	2.3341	27 4 5.0	4.542
18	14 39 55.72	2.2387	20 52 35.4	11.065	18	16 30 2.66	2.3348	27 8 33.0	4.393
19	14 42 10.12	2.2412	21 3 35.6	10.941	19	16 32 22.77	2.3355	27 12 52.1	4.244
20	14 44 24.67	2.2438	21 14 28.3	10.816	20	16 34 42.92	2.3362	27 17 2.3	4.095
21	14 46 39.38	2.2464	21 25 13.5	10.691	21	16 37 3.12	2.3369	27 21 3.5	3.945
22	14 48 54.24	2.2490	21 35 51.2	10.564	22	16 39 23.35	2.3374	27 24 55.7	3.795
23	14 51 9.26	2.2517	21 46 21.2	10.437	23	16 41 43.60	2.3378	27 28 38.9	3.646
24	14 53 24.44	2.2543	S. 21 56 43.6	10.309	24	16 44 3.88	2.3382	S. 27 32 13.2	3.497

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 44 3.88	2.3382	S. 27 32 13.2	3.497
1	16 46 24.18	2.3384	27 35 38.5	3.346
2	16 48 44.49	2.3386	27 38 54.7	3.195
3	16 51 4.81	2.3387	27 42 1.9	3.045
4	16 53 25.13	2.3387	27 45 0.1	2.895
5	16 55 45.45	2.3387	27 47 49.3	2.746
6	16 58 5.77	2.3386	27 50 29.6	2.596
7	17 0 26.08	2.3383	27 53 0.8	2.445
8	17 2 46.37	2.3379	27 55 23.0	2.295
9	17 5 6.63	2.3375	27 57 36.2	2.145
10	17 7 26.87	2.3371	27 59 40.4	1.995
11	17 9 47.08	2.3365	28 1 35.6	1.846
12	17 12 7.25	2.3358	28 3 21.9	1.696
13	17 14 27.38	2.3351	28 4 59.1	1.546
14	17 16 47.46	2.3342	28 6 27.4	1.397
15	17 19 7.49	2.3333	28 7 46.7	1.247
16	17 21 27.46	2.3323	28 8 57.1	1.098
17	17 23 47.37	2.3313	28 9 58.5	0.949
18	17 26 7.22	2.3302	28 10 51.0	0.801
19	17 28 26.99	2.3289	28 11 34.6	0.652
20	17 30 46.68	2.3275	28 12 9.3	0.504
21	17 33 6.29	2.3261	28 12 35.1	0.356
22	17 35 25.81	2.3245	28 12 52.0	0.208
23	17 37 45.23	2.3228	S. 28 13 0.1	−0.061

SATURDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 40 4.55	2.3211	S. 28 12 59.3	+0.087
1	17 42 23.76	2.3193	28 12 49.7	0.233
2	17 44 42.87	2.3176	28 12 31.3	0.379
3	17 47 1.87	2.3157	28 12 4.2	0.525
4	17 49 20.75	2.3136	28 11 28.3	0.671
5	17 51 39.50	2.3114	28 10 43.7	0.816
6	17 53 58.12	2.3092	28 9 50.4	0.961
7	17 56 16.61	2.3069	28 8 48.4	1.105
8	17 58 34.95	2.3045	28 7 37.8	1.249
9	18 0 53.15	2.3021	28 6 18.5	1.393
10	18 3 11.20	2.2996	28 4 50.6	1.536
11	18 5 29.10	2.2970	28 3 14.2	1.678
12	18 7 46.84	2.2943	28 1 29.3	1.820
13	18 10 4.42	2.2916	27 59 35.8	1.962
14	18 12 21.83	2.2887	27 57 33.9	2.103
15	18 14 39.06	2.2858	27 55 23.5	2.243
16	18 16 56.12	2.2828	27 53 4.7	2.383
17	18 19 13.00	2.2797	27 50 37.5	2.522
18	18 21 29.69	2.2766	27 48 2.0	2.661
19	18 23 46.19	2.2734	27 45 18.2	2.799
20	18 26 2.50	2.2702	27 42 26.1	2.937
21	18 28 18.61	2.2668	27 39 25.8	3.073
22	18 30 34.51	2.2633	27 36 17.3	3.210
23	18 32 50.21	2.2599	27 33 0.6	3.346
24	18 35 5.70	2.2563	S. 27 29 35.8	3.481

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 35 5.70	2.2563	S. 27 29 35.8	3.481
1	18 37 20.97	2.2528	27 26 2.9	3.615
2	18 39 36.03	2.2492	27 22 22.0	3.748
3	18 41 50.87	2.2455	27 18 33.1	3.881
4	18 44 5.49	2.2417	27 14 36.3	4.014
5	18 46 19.87	2.2378	27 10 31.5	4.146
6	18 48 34.02	2.2339	27 6 18.8	4.277
7	18 50 47.94	2.2300	27 1 58.3	4.406
8	18 53 1.62	2.2259	26 57 30.1	4.535
9	18 55 15.05	2.2218	26 52 54.1	4.664
10	18 57 28.24	2.2178	26 48 10.4	4.792
11	18 59 41.18	2.2137	26 43 19.1	4.918
12	19 1 53.88	2.2095	26 38 20.2	5.045
13	19 4 6.32	2.2052	26 33 13.7	5.171
14	19 6 18.51	2.2010	26 27 59.7	5.295
15	19 8 30.44	2.1967	26 22 38.3	5.418
16	19 10 42.11	2.1923	26 17 9.5	5.542
17	19 12 53.51	2.1878	26 11 33.3	5.664
18	19 15 4.65	2.1834	26 5 49.8	5.786
19	19 17 15.52	2.1789	25 59 59.0	5.907
20	19 19 26.12	2.1745	25 54 1.0	6.026
21	19 21 36.46	2.1700	25 47 55.9	6.144
22	19 23 46.52	2.1654	25 41 43.7	6.263
23	19 25 56.31	2.1608	S. 25 35 24.4	6.381

MONDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 28 5.82	2.1562	S. 25 28 58.0	6.498
1	19 30 15.05	2.1515	25 22 24.7	6.613
2	19 32 24.00	2.1468	25 15 44.5	6.727
3	19 34 32.67	2.1422	25 8 57.5	6.840
4	19 36 41.06	2.1374	25 2 3.7	6.953
5	19 38 49.16	2.1327	24 55 3.2	7.065
6	19 40 56.98	2.1279	24 47 55.9	7.177
7	19 43 4.51	2.1232	24 40 42.0	7.287
8	19 45 11.76	2.1184	24 33 21.5	7.396
9	19 47 18.72	2.1136	24 25 54.5	7.504
10	19 49 25.39	2.1087	24 18 21.0	7.612
11	19 51 31.77	2.1039	24 10 41.1	7.718
12	19 53 37.86	2.0992	24 2 54.8	7.824
13	19 55 43.67	2.0943	23 55 2.2	7.928
14	19 57 49.18	2.0894	23 47 3.4	8.032
15	19 59 54.40	2.0846	23 38 58.3	8.136
16	20 1 59.33	2.0797	23 30 47.1	8.238
17	20 4 3.97	2.0749	23 22 29.8	8.339
18	20 6 8.32	2.0701	23 14 6.4	8.440
19	20 8 12.38	2.0652	23 5 37.0	8.538
20	20 10 16.15	2.0603	22 57 1.8	8.636
21	20 12 19.62	2.0554	22 48 20.7	8.733
22	20 14 22.80	2.0507	22 39 33.8	8.830
23	20 16 25.70	2.0459	22 30 41.1	8.926
24	20 18 28.31	2.0411	S. 22 21 42.7	9.021

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 18 28.31	2.0411	S. 22 21 42.7	9.021
1	20 20 30.63	2.0362	22 12 38.6	9.114
2	20 22 32.66	2.0314	22 3 29.0	9.207
3	20 24 34.40	2.0267	21 54 13.8	9.299
4	20 26 35.86	2.0219	21 44 53.1	9.390
5	20 28 37.03	2.0172	21 35 27.0	9.479
6	20 30 37.92	2.0124	21 25 55.6	9.568
7	20 32 38.52	2.0077	21 16 18.9	9.657
8	20 34 38.84	2.0030	21 6 36.8	9.745
9	20 36 38.88	1.9983	20 56 49.5	9.831
10	20 38 38.64	1.9937	20 46 57.1	9.916
11	20 40 38.12	1.9891	20 36 59.6	10.001
12	20 42 37.33	1.9845	20 26 57.0	10.085
13	20 44 36.26	1.9798	20 16 49.4	10.167
14	20 46 34.91	1.9752	20 6 36.9	10.248
15	20 48 33.29	1.9707	19 56 19.6	10.328
16	20 50 31.40	1.9662	19 45 57.5	10.408
17	20 52 29.24	1.9617	19 35 30.6	10.487
18	20 54 26.81	1.9572	19 24 59.0	10.566
19	20 56 24.11	1.9528	19 14 22.7	10.643
20	20 58 21.15	1.9485	19 3 41.8	10.719
21	21 0 17.93	1.9442	18 52 56.4	10.794
22	21 2 14.45	1.9398	18 42 6.5	10.869
23	21 4 10.71	1.9355	S. 18 31 12.1	10.942

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 6 6.71	1.9313	S. 18 20 13.4	11.014
1	21 8 2.46	1.9271	18 9 10.4	11.087
2	21 9 57.96	1.9228	17 58 3.0	11.158
3	21 11 53.20	1.9187	17 46 51.4	11.228
4	21 13 48.20	1.9146	17 35 35.6	11.297
5	21 15 42.95	1.9105	17 24 15.8	11.364
6	21 17 37.46	1.9065	17 12 51.9	11.431
7	21 19 31.73	1.9025	17 1 24.0	11.498
8	21 21 25.76	1.8986	16 49 52.2	11.563
9	21 23 19.56	1.8947	16 38 16.4	11.628
10	21 25 13.12	1.8908	16 26 36.8	11.692
11	21 27 6.45	1.8870	16 14 53.4	11.755
12	21 28 59.56	1.8832	16 3 6.2	11.817
13	21 30 52.44	1.8795	15 51 15.4	11.878
14	21 32 45.10	1.8758	15 39 20.9	11.938
15	21 34 37.54	1.8722	15 27 22.8	11.997
16	21 36 29.76	1.8686	15 15 21.2	12.056
17	21 38 21.77	1.8650	15 3 16.1	12.113
18	21 40 13.56	1.8614	14 51 7.6	12.170
19	21 42 5.14	1.8580	14 38 55.7	12.226
20	21 43 56.52	1.8547	14 26 40.5	12.282
21	21 45 47.70	1.8514	14 14 21.9	12.337
22	21 47 38.69	1.8481	14 2 0.1	12.389
23	21 49 29.48	1.8448	13 49 35.2	12.441
24	21 51 20.07	1.8416	S. 13 37 7.2	12.492

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 51 20.07	1.8416	S. 13 37 7.2	12.492
1	21 53 10.47	1.8385	13 24 36.1	12.543
2	21 55 0.69	1.8354	13 12 2.0	12.594
3	21 56 50.72	1.8323	12 59 24.8	12.644
4	21 58 40.57	1.8293	12 46 44.7	12.692
5	22 0 30.24	1.8264	12 34 1.8	12.739
6	22 2 19.74	1.8236	12 21 16.0	12.787
7	22 4 9.07	1.8207	12 8 27.4	12.833
8	22 5 58.23	1.8179	11 55 36.1	12.877
9	22 7 47.22	1.8152	11 42 42.2	12.921
10	22 9 36.05	1.8126	11 29 45.6	12.965
11	22 11 24.73	1.8100	11 16 46.4	13.007
12	22 13 13.25	1.8074	11 3 44.7	13.049
13	22 15 1.62	1.8049	10 50 40.5	13.090
14	22 16 49.84	1.8025	10 37 33.9	13.131
15	22 18 37.92	1.8002	10 24 24.8	13.171
16	22 20 25.86	1.7978	10 11 13.4	13.209
17	22 22 13.66	1.7956	9 57 59.8	13.246
18	22 24 1.33	1.7934	9 44 43.9	13.283
19	22 25 48.87	1.7912	9 31 25.8	13.320
20	22 27 36.28	1.7891	9 18 5.5	13.356
21	22 29 23.56	1.7871	9 4 43.1	13.391
22	22 31 10.73	1.7852	8 51 18.6	13.424
23	22 32 57.78	1.7833	S. 8 37 52.2	13.457

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 34 44.72	1.7814	S. 8 24 23.8	13.490
1	22 36 31.55	1.7797	8 10 53.4	13.522
2	22 38 18.28	1.7779	7 57 21.2	13.552
3	22 40 4.90	1.7762	7 43 47.2	13.582
4	22 41 51.42	1.7746	7 30 11.4	13.611
5	22 43 37.85	1.7731	7 16 33.9	13.639
6	22 45 24.19	1.7716	7 2 54.7	13.667
7	22 47 10.44	1.7702	6 49 13.9	13.693
8	22 48 56.61	1.7688	6 35 31.5	13.720
9	22 50 42.70	1.7676	6 21 47.5	13.746
10	22 52 28.72	1.7663	6 8 2.0	13.770
11	22 54 14.66	1.7651	5 54 15.1	13.794
12	22 56 0.53	1.7640	5 40 26.7	13.817
13	22 57 46.34	1.7630	5 26 37.0	13.839
14	22 59 32.09	1.7620	5 12 46.0	13.861
15	23 1 17.78	1.7611	4 58 53.7	13.882
16	23 3 3.42	1.7603	4 45 0.1	13.902
17	23 4 49.01	1.7595	4 31 5.4	13.921
18	23 6 34.56	1.7588	4 17 9.6	13.939
19	23 8 20.07	1.7582	4 3 12.7	13.957
20	23 10 5.54	1.7575	3 49 14.8	13.974
21	23 11 50.97	1.7570	3 35 15.8	13.991
22	23 13 36.38	1.7566	3 21 15.9	14.006
23	23 15 21.76	1.7562	3 7 15.1	14.021
24	23 17 7.12	1.7558	S. 2 53 13.4	14.035

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 17 7.12	1.7558	S. 2 53 13.4	14.035
1	23 18 52.46	1.7556	2 39 10.9	14.048
2	23 20 37.79	1.7554	2 25 7.7	14.060
3	23 22 23.11	1.7552	2 11 3.7	14.072
4	23 24 8.42	1.7552	1 56 59.0	14.083
5	23 25 53.73	1.7553	1 42 53.7	14.093
6	23 27 39.05	1.7554	1 28 47.8	14.102
7	23 29 24.38	1.7555	1 14 41.4	14.111
8	23 31 9.71	1.7556	1 0 34.5	14.119
9	23 32 55.05	1.7558	0 46 27.1	14.127
10	23 34 40.41	1.7562	0 32 19.3	14.133
11	23 36 25.80	1.7567	0 18 11.2	14.138
12	23 38 11.21	1.7571	S. 0 4 2.7	14.143
13	23 39 56.65	1.7577	N. 0 10 6.0	14.147
14	23 41 42.13	1.7583	0 24 14.9	14.151
15	23 43 27.65	1.7590	0 38 24.1	14.154
16	23 45 13.21	1.7598	0 52 33.4	14.156
17	23 46 58.82	1.7606	1 6 42.8	14.157
18	23 48 44.48	1.7614	1 20 52.2	14.157
19	23 50 30.19	1.7624	1 35 1.6	14.156
20	23 52 15.97	1.7635	1 49 10.9	14.155
21	23 54 1.81	1.7646	2 3 20.2	14.153
22	23 55 47.72	1.7658	2 17 29.3	14.150
23	23 57 33.70	1.7670	N. 2 31 38.2	14.147

SUNDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	23 59 19.76	1.7683	N. 2 45 46.9	14.143
1	0 1 5.90	1.7697	2 59 55.3	14.138
2	0 2 52.12	1.7711	3 14 3.4	14.132
3	0 4 38.43	1.7726	3 28 11.1	14.125
4	0 6 24.83	1.7742	3 42 18.4	14.117
5	0 8 11.33	1.7759	3 56 25.2	14.108
6	0 9 57.94	1.7777	4 10 31.4	14.099
7	0 11 44.65	1.7794	4 24 37.1	14.090
8	0 13 31.47	1.7813	4 38 42.2	14.079
9	0 15 18.41	1.7833	4 52 46.6	14.068
10	0 17 5.47	1.7853	5 6 50.3	14.056
11	0 18 52.65	1.7873	5 20 53.3	14.043
12	0 20 39.95	1.7894	5 34 55.5	14.029
13	0 22 27.38	1.7917	5 48 56.8	14.014
14	0 24 14.95	1.7941	6 2 57.2	13.999
15	0 26 2.67	1.7965	6 16 56.7	13.982
16	0 27 50.53	1.7989	6 30 55.1	13.965
17	0 29 38.54	1.8014	6 44 52.5	13.947
18	0 31 26.70	1.8040	6 58 48.8	13.928
19	0 33 15.02	1.8067	7 12 43.9	13.908
20	0 35 3.50	1.8093	7 26 37.8	13.888
21	0 36 52.14	1.8121	7 40 30.5	13.867
22	0 38 40.95	1.8150	7 54 21.9	13.845
23	0 40 29.94	1.8181	8 8 11.9	13.821
24	0 42 19.12	1.8212	N. 8 22 0.4	13.797

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 42 19.12	1.8212	N. 8 22 0.4	13.797
1	0 44 8.48	1.8242	8 35 47.5	13.773
2	0 45 58.02	1.8273	8 49 33.1	13.748
3	0 47 47.75	1.8305	9 3 17.2	13.722
4	0 49 37.68	1.8338	9 16 59.7	13.694
5	0 51 27.81	1.8372	9 30 40.5	13.665
6	0 53 18.15	1.8407	9 44 19.5	13.635
7	0 55 8.70	1.8442	9 57 56.7	13.605
8	0 56 59.46	1.8478	10 11 32.1	13.574
9	0 58 50.44	1.8515	10 25 5.6	13.542
10	1 0 41.64	1.8553	10 38 37.2	13.509
11	1 2 33.07	1.8591	10 52 6.7	13.475
12	1 4 24.73	1.8629	11 5 34.2	13.441
13	1 6 16.62	1.8669	11 18 59.6	13.405
14	1 8 8.76	1.8710	11 32 22.8	13.368
15	1 10 1.14	1.8751	11 45 43.8	13.331
16	1 11 53.77	1.8793	11 59 2.6	13.293
17	1 13 46.65	1.8835	12 12 19.0	13.253
18	1 15 39.79	1.8878	12 25 33.0	13.213
19	1 17 33.19	1.8922	12 38 44.6	13.172
20	1 19 26.86	1.8967	12 51 53.6	13.129
21	1 21 20.80	1.9012	13 5 0.1	13.086
22	1 23 15.01	1.9058	13 18 4.0	13.042
23	1 25 9.50	1.9106	N.13 31 5.1	12.996

TUESDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 27 4.28	1.9153	N.13 44 3.5	12.950
1	1 28 59.34	1.9201	13 56 59.1	12.902
2	1 30 54.69	1.9250	14 9 51.8	12.854
3	1 32 50.34	1.9300	14 22 41.6	12.805
4	1 34 46.29	1.9350	14 35 28.4	12.754
5	1 36 42.54	1.9401	14 48 12.1	12.702
6	1 38 39.10	1.9453	15 0 52.6	12.649
7	1 40 35.97	1.9505	15 13 30.0	12.596
8	1 42 33.16	1.9557	15 26 4.2	12.542
9	1 44 30.66	1.9611	15 38 35.0	12.485
10	1 46 28.49	1.9666	15 51 2.4	12.428
11	1 48 26.65	1.9721	16 3 26.4	12.371
12	1 50 25.14	1.9776	16 15 46.9	12.312
13	1 52 23.96	1.9833	16 28 3.8	12.252
14	1 54 23.13	1.9890	16 40 17.1	12.190
15	1 56 22.64	1.9948	16 52 26.6	12.127
16	1 58 22.50	2.0006	17 4 32.3	12.063
17	2 0 22.71	2.0064	17 16 34.2	11.999
18	2 2 23.27	2.0123	17 28 32.2	11.933
19	2 4 24.19	2.0183	17 40 26.2	11.866
20	2 6 25.47	2.0244	17 52 16.1	11.798
21	2 8 27.12	2.0306	18 4 1.9	11.728
22	2 10 29.14	2.0368	18 15 43.5	11.657
23	2 12 31.53	2.0430	18 27 20.8	11.585
24	2 14 34.30	2.0493	N.18 38 53.7	11.512

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	2 14 34.30	2.0493	N.18 38 53.7	11.512
1	2 16 37.45	2.0557	18 50 22.2	11.437
2	2 18 40.98	2.0620	19 1 46.2	11.362
3	2 20 44.89	2.0685	19 13 5.7	11.286
4	2 22 49.20	2.0751	19 24 20.5	11.208
5	2 24 53.90	2.0816	19 35 30.6	11.128
6	2 26 58.99	2.0882	19 46 35.9	11.047
7	2 29 4.48	2.0949	19 57 36.3	10.966
8	2 31 10.38	2.1017	20 8 31.8	10.883
9	2 33 16.68	2.1084	20 19 22.2	10.798
10	2 35 23.38	2.1152	20 30 7.5	10.712
11	2 37 30.50	2.1221	20 40 47.6	10.625
12	2 39 38.03	2.1290	20 51 22.5	10.537
13	2 41 45.98	2.1359	21 1 52.0	10.447
14	2 43 54.34	2.1428	21 12 16.1	10.356
15	2 46 3.12	2.1499	21 22 34.7	10.263
16	2 48 12.33	2.1570	21 32 47.7	10.169
17	2 50 21.96	2.1640	21 42 55.0	10.074
18	2 52 32.01	2.1711	21 52 56.6	9.978
19	2 54 42.49	2.1783	22 2 52.4	9.881
20	2 56 53.40	2.1855	22 12 42.3	9.781
21	2 59 4.75	2.1927	22 22 26.1	9.679
22	3 1 16.53	2.2000	22 32 3.8	9.577
23	3 3 28.75	2.2073	N.22 41 35.4	9.475

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	3 5 41.40	2.2145	N.22 51 0.8	9.370
1	3 7 54.49	2.2218	23 0 19.8	9.263
2	3 10 8.02	2.2292	23 9 32.4	9.156
3	3 12 21.99	2.2365	23 18 38.5	9.047
4	3 14 36.40	2.2438	23 27 38.0	8.937
5	3 16 51.25	2.2512	23 36 30.9	8.825
6	3 19 6.55	2.2587	23 45 17.0	8.712
7	3 21 22.29	2.2660	23 53 56.3	8.597
8	3 23 38.47	2.2733	24 2 28.6	8.480
9	3 25 55.09	2.2807	24 10 53.9	8.362
10	3 28 12.16	2.2882	24 19 12.1	8.243
11	3 30 29.67	2.2956	24 27 23.1	8.122
12	3 32 47.63	2.3030	24 35 26.8	8.000
13	3 35 6.03	2.3103	24 43 23.1	7.877
14	3 37 24.87	2.3177	24 51 12.0	7.753
15	3 39 44.15	2.3251	24 58 53.4	7.627
16	3 42 3.88	2.3325	25 6 27.2	7.498
17	3 44 24.05	2.3398	25 13 53.2	7.368
18	3 46 44.65	2.3470	25 21 11.4	7.237
19	3 49 5.69	2.3543	25 28 21.7	7.106
20	3 51 27.17	2.3616	25 35 24.1	6.973
21	3 53 49.09	2.3689	25 42 18.4	6.838
22	3 56 11.44	2.3761	25 49 4.6	6.701
23	3 58 34.22	2.3832	25 55 42.5	6.563
24	4 0 57.43	2.3904	N.26 2 12.1	6.423

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 0 57.43	2.3904	N.26 2 12.1	6.423
1	4 3 21.07	2.3975	26 8 33.3	6.282
2	4 5 45.13	2.4045	26 14 46.0	6.140
3	4 8 9.61	2.4115	26 20 50.1	5.997
4	4 10 34.51	2.4184	26 26 45.6	5.852
5	4 12 59.82	2.4253	26 32 32.3	5.705
6	4 15 25.55	2.4322	26 38 10.2	5.558
7	4 17 51.69	2.4390	26 43 39.2	5.408
8	4 20 18.23	2.4457	26 48 59.2	5.256
9	4 22 45.17	2.4523	26 54 10.0	5.104
10	4 25 12.51	2.4590	26 59 11.7	4.952
11	4 27 40.25	2.4656	27 4 4.2	4.797
12	4 30 8.38	2.4721	27 8 47.3	4.640
13	4 32 36.90	2.4784	27 13 21.0	4.482
14	4 35 5.79	2.4846	27 17 45.2	4.324
15	4 37 35.05	2.4908	27 21 59.9	4.165
16	4 40 4.68	2.4969	27 26 5.0	4.003
17	4 42 34.68	2.5030	27 30 0.3	3.840
18	4 45 5.04	2.5089	27 33 45.8	3.676
19	4 47 35.75	2.5147	27 37 21.4	3.511
20	4 50 6.81	2.5205	27 40 47.1	3.345
21	4 52 38.21	2.5262	27 44 2.8	3.177
22	4 55 9.95	2.5317	27 47 8.4	3.009
23	4 57 42.01	2.5371	N.27 50 3.9	2.839

SATURDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 0 14.40	2.5425	N.27 52 49.1	2.668

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, . .	1	22	20.8
● New Moon, . .	8	17	17.2
☽ First Quarter, .	15	10	28.1
○ Full Moon, . .	23	11	10.5
☾ Last Quarter, .	31	9	15.5

	d	h
☾ Perigee, . . .	8	22.8
☾ Apogee, ...	22	19.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P.L of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
1	Fomalhaut	W.	60° 42′ 2″	3231	62° 7′ 34″	3207	63° 33′ 35″	3183	65° 0′ 4″	3159
	Mars	W.	40 52 40	2931	42 24 19	2913	43 56 21	2895	45 28 46	2876
	Saturn	W.	39 19 27	2839	40 53 4	2825	42 27 0	2810	44 1 15	2795
	α Pegasi	W.	38 41 7	3388	40 3 37	3340	41 27 2	3295	42 51 19	3253
	Pollux	E.	82 42 6	2841	81 8 31	2828	79 34 39	2814	78 0 29	2800
	Sun	E.	100 51 46	3181	99 25 14	3167	97 58 25	3152	96 31 18	3138
2	Fomalhaut	W.	72 19 26	3049	73 48 38	3027	75 18 17	3006	76 48 22	2986
	Mars	W.	53 16 42	2786	54 51 28	2768	56 26 38	2750	58 2 12	2731
	Saturn	W.	51 57 33	2716	53 33 51	2700	55 10 31	2683	56 47 34	2666
	α Pegasi	W.	50 4 18	3074	51 32 59	3043	53 2 19	3013	54 32 16	2983
	Pollux	E.	70 5 0	2726	68 28 55	2710	66 52 29	2695	65 15 42	2679
	Sun	E.	89 11 4	3056	87 42 1	3039	86 12 37	3022	84 42 51	3004
3	Mars	W.	66 6 18	2637	67 44 23	2617	69 22 55	2598	71 1 53	2578
	Saturn	W.	64 58 34	2579	66 37 58	2561	68 17 47	2543	69 58 1	2525
	α Pegasi	W.	62 10 55	2848	63 44 20	2823	65 18 18	2798	66 52 48	2774
	Pollux	E.	57 6 16	2595	55 27 14	2577	53 47 48	2560	52 7 58	2542
	Sun	E.	77 8 23	2912	75 36 19	2892	74 3 50	2873	72 30 57	2854
4	Mars	W.	79 23 24	2482	81 5 3	2462	82 47 9	2443	84 29 42	2424
	Saturn	W.	78 25 34	2432	80 8 23	2414	81 51 38	2395	83 35 20	2377
	α Pegasi	W.	74 53 5	2660	76 30 39	2638	78 8 42	2617	79 47 14	2596
	α Arietis	W.	31 41 29	2502	33 22 40	2478	35 4 24	2455	36 46 41	2433
	Pollux	E.	43 42 40	2455	42 0 23	2437	40 17 41	2419	38 34 34	2403
	Sun	E.	64 40 12	2756	63 4 46	2735	61 28 53	2716	59 52 34	2696
5	α Arietis	W.	45 25 50	2328	47 11 9	2308	48 56 57	2289	50 43 13	2270
	Sun	E.	51 44 24	2599	50 5 27	2580	48 26 5	2561	46 46 17	2543
6	α Arietis	W.	59 41 14	2183	61 30 7	2167	63 19 24	2152	65 9 4	2137
	Sun	E.	38 21 6	2458	36 38 53	2441	34 56 17	2426	33 13 19	2411
10	Sun	W.	18 11 8	2294	19 57 16	2300	21 43 15	2307	23 29 4	2315
	Antares	E.	91 56 27	2000	90 2 52	2007	88 9 29	2015	86 16 18	2024
	Jupiter	E.	107 51 52	2009	105 58 31	2016	104 5 22	2024	102 12 25	2032
11	Sun	W.	32 14 44	2369	33 59 3	2382	35 43 3	2396	37 26 44	2410
	Antares	E.	76 54 9	2077	75 2 35	2089	73 11 19	2102	71 20 23	2116
	Jupiter	E.	92 51 20	2086	90 59 59	2098	89 8 56	2111	87 18 13	2124
12	Sun	W.	45 59 54	2488	47 41 24	2504	49 22 31	2522	51 3 14	2540
	Venus	W.	20 13 10	2601	21 52 3	2615	23 30 38	2629	25 8 54	2643
	Antares	E.	62 11 6	2190	60 22 23	2206	58 34 4	2222	56 46 9	2238
	Jupiter	E.	78 10 4	2199	76 21 35	2216	74 33 31	2232	72 45 51	2249
13	Sun	W.	59 20 36	2631	60 58 49	2650	62 36 36	2669	64 13 58	2687
	Venus	W.	33 14 48	2729	34 50 49	2748	36 26 25	2766	38 1 37	2785
	Antares	E.	47 52 47	2324	46 7 23	2342	44 22 24	2359	42 37 51	2377
	Jupiter	E.	63 53 57	2338	62 8 53	2356	60 24 15	2375	58 40 4	2394
14	Sun	W.	72 14 27	2783	73 49 17	2802	75 23 42	2821	76 57 43	2840
	Venus	W.	45 51 28	2880	47 24 13	2899	48 56 33	2918	50 28 29	2937

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut	W.	66° 27′ 2″	3137	67° 54′ 27″	3114	69° 22′ 20″	3091	70° 50′ 40″	3070
	Mars	W.	47 1 35	2859	48 34 47	2841	50 8 22	2823	51 42 20	2805
	Saturn	W.	45 35 50	2779	47 10 45	2764	48 46 0	2748	50 21 36	2732
	α Pegasi	W.	44 16 25	3214	45 42 18	3176	47 8 56	3140	48 36 17	3107
	Pollux	E.	76 26 1	2785	74 51 14	2771	73 16 8	2757	71 40 44	2742
	Sun	E.	95 3 54	3122	93 36 11	3106	92 8 8	3090	90 39 46	3073
2	Fomalhaut	W.	78 18 52	2965	79 49 48	2946	81 21 9	2926	82 52 55	2906
	Mars	W.	59 38 11	2712	61 14 35	2693	62 51 24	2675	64 28 38	2655
	Saturn	W.	58 24 59	2649	60 2 47	2632	61 40 59	2615	63 19 34	2596
	α Pegasi	W.	56 2 50	2954	57 34 0	2927	59 5 44	2900	60 38 3	2874
	Pollux	E.	63 38 34	2663	62 1 4	2646	60 23 11	2629	58 44 55	2612
	Sun	E.	83 12 43	2986	81 42 13	2968	80 11 20	2949	78 40 3	2931
3	Mars	W.	72 41 18	2559	74 21 9	2540	76 1 27	2520	77 42 12	2501
	Saturn	W.	71 38 40	2506	73 19 45	2488	75 1 15	2470	76 43 11	2450
	α Pegasi	W.	68 27 50	2750	70 3 23	2727	71 39 27	2704	73 16 1	2682
	Pollux	E.	50 27 43	2525	48 47 4	2507	47 6 1	2489	45 24 33	2472
	Sun	E.	70 57 39	2835	69 23 56	2815	67 49 47	2795	66 15 12	2775
4	Mars	W.	86 12 42	2405	87 56 9	2387	89 40 3	2368	91 24 24	2349
	Saturn	W.	85 19 28	2358	87 4 3	2340	88 49 4	2322	90 34 32	2304
	α Pegasi	W.	81 26 14	2576	83 5 42	2556	84 45 37	2537	86 25 59	2517
	α Arietis	W.	38 29 29	2410	40 12 49	2389	41 56 39	2368	43 41 0	2348
	Pollux	E.	36 51 3	2386	35 7 8	2370	33 22 50	2353	31 38 8	2338
	Sun	E.	58 15 49	2676	56 38 37	2657	55 0 59	2638	53 22 55	2618
5	α Arietis	W.	52 29 56	2252	54 17 6	2234	56 4 43	2216	57 52 46	2200
	Sun	E.	45 6 4	2525	43 25 26	2507	41 44 23	2490	40 2 56	2474
6	α Arietis	W.	66 59 6	2123	68 49 30	2109	70 40 15	2096	72 31 20	2084
	Sun	E.	31 30 0	2397	29 46 21	2383	28 2 22	2371	26 18 5	2359
10	Sun	W.	25 14 41	2324	27 0 5	2335	28 45 14	2346	30 30 7	2357
	Antares	E.	84 23 21	2033	82 30 39	2043	80 38 12	2054	78 46 2	2065
	Jupiter	E.	100 19 41	2042	98 27 12	2052	96 34 58	2062	94 43 0	2073
11	Sun	W.	39 10 5	2424	40 53 5	2439	42 35 44	2455	44 18 1	2472
	Antares	E.	69 29 48	2130	67 39 34	2144	65 49 42	2159	64 0 12	2174
	Jupiter	E.	85 27 51	2138	83 37 50	2153	81 48 12	2169	79 58 57	2183
12	Sun	W.	52 43 32	2558	54 23 25	2575	56 2 54	2593	57 41 58	2612
	Venus	W.	26 46 50	2660	28 24 24	2677	30 1 35	2694	31 38 23	2711
	Antares	E.	54 58 38	2255	53 11 32	2272	51 24 52	2289	49 38 37	2307
	Jupiter	E.	70 58 37	2266	69 11 48	2284	67 25 25	2302	65 39 28	2320
13	Sun	W.	65 50 55	2707	67 27 26	2725	69 3 32	2745	70 39 12	2764
	Venus	W.	39 36 24	2804	41 10 47	2823	42 44 45	2842	44 18 19	2861
	Antares	E.	40 53 43	2395	39 10 1	2413	37 26 45	2431	35 43 54	2449
	Jupiter	E.	56 56 20	2412	55 13 3	2431	53 30 13	2450	51 47 50	2470
14	Sun	W.	78 31 19	2859	80 4 31	2876	81 37 20	2895	83 9 45	2913
	Venus	W.	52 0 1	2956	53 31 9	2974	55 1 54	2993	56 32 16	3011

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14	Antares	E.	34° 1′ 29″	2467	32° 19′ 29″	2484	30° 37′ 53″	2502	28° 56′ 42″	2520
	Jupiter	E.	50 5 54	2489	48 24 25	2508	46 43 23	2527	45 2 48	2548
	α Aquilæ	E.	88 56 15	3181	87 29 43	3200	86 3 34	3220	84 37 49	3242
15	Sun	W.	84 41 47	2931	86 13 27	2949	87 44 44	2966	89 15 39	2983
	Venus	W.	58 2 15	3030	59 31 51	3047	61 1 5	3065	62 29 58	3082
	Spica	W.	25 22 40	2617	27 1 12	2632	28 39 24	2646	30 17 16	2660
	Jupiter	E.	36 46 41	2646	35 8 49	2668	33 31 26	2689	31 54 31	2710
	α Aquilæ	E.	77 35 46	3364	76 12 48	3391	74 50 21	3419	73 28 26	3449
16	Sun	W.	96 45 1	3065	98 13 53	3081	99 42 26	3096	101 10 41	3110
	Venus	W.	69 49 8	3166	71 15 58	3181	72 42 30	3197	74 8 43	3212
	Spica	W.	38 21 36	2734	39 57 31	2748	41 33 7	2762	43 8 25	2775
	α Aquilæ	E.	66 47 31	3614	65 29 12	3651	64 11 33	3690	62 54 35	3731
17	Sun	W.	108 27 35	3180	109 54 8	3192	111 20 27	3204	112 46 31	3216
	Venus	W.	81 15 27	3282	82 39 59	3296	84 4 15	3308	85 28 17	3320
	Spica	W.	51 0 43	2837	52 34 23	2849	54 7 47	2860	55 40 57	2871
	α Aquilæ	E.	56 41 10	3968	55 28 59	4024	54 17 43	4082	53 7 24	4145
	Fomalhaut	E.	77 52 17	3150	76 25 8	3167	74 58 19	3183	73 31 49	3198
	Saturn	E.	95 15 11	2819	93 41 8	2831	92 7 20	2842	90 33 47	2853
18	Sun	W.	119 53 26	3271	121 18 11	3281	122 42 45	3290	124 7 8	3300
	Venus	W.	92 25 2	3377	93 47 45	3387	95 10 16	3397	96 32 36	3407
	Spica	W.	63 23 25	2921	64 55 17	2930	66 26 58	2939	67 58 28	2947
	α Aquilæ	E.	47 32 3	4530	46 28 37	4625	45 26 34	4728	44 25 58	4841
	Fomalhaut	E.	66 24 16	3285	64 59 47	3303	63 35 39	3322	62 11 53	3342
	Mars	E.	81 45 55	2901	80 13 38	2910	78 41 32	2919	77 9 37	2927
	Saturn	E.	82 49 24	2903	81 17 9	2912	79 45 6	2921	78 13 14	2930
19	Spica	W.	75 33 27	2984	77 4 0	2991	78 34 24	2997	80 4 41	3003
	Antares	W.	29 39 5	2983	31 9 39	2989	32 40 6	2995	34 10 25	3001
	Fomalhaut	E.	55 18 57	3451	53 57 38	3476	52 35 47	3502	51 16 25	3530
	Mars	E.	69 32 37	2965	68 1 41	2973	66 30 54	2980	65 0 16	2986
	Saturn	E.	70 36 27	2967	69 5 33	2974	67 34 48	2981	66 4 11	2987
	α Pegasi	E.	76 25 48	3201	74 59 40	3211	73 33 44	3221	72 8 0	3231
20	Spica	W.	87 34 20	3028	89 3 58	3033	90 33 30	3037	92 2 57	3040
	Antares	W.	41 40 17	3026	43 9 57	3030	44 39 32	3034	46 9 2	3039
	Jupiter	W.	26 17 3	3109	27 45 2	3105	29 13 5	3102	30 41 12	3101
	Fomalhaut	E.	44 42 57	3701	43 26 11	3741	42 10 10	3791	40 51 58	3841
	Mars	E.	57 29 4	3017	55 59 12	3023	54 29 28	3028	52 59 50	3034
	Saturn	E.	58 32 54	3014	57 2 58	3018	55 33 8	3022	54 3 23	3027
	α Pegasi	E.	65 2 14	3282	63 37 42	3293	62 13 22	3305	60 49 16	3316
21	Antares	W.	53 35 28	3053	55 4 35	3056	56 33 39	3058	58 2 40	3060
	Jupiter	W.	38 2 9	3097	39 30 22	3097	40 58 35	3097	42 26 48	3096
	Mars	E.	45 33 31	3064	44 4 37	3070	42 35 51	3077	41 7 13	3084
	Saturn	E.	46 35 55	3046	45 6 39	3049	43 37 27	3052	42 8 18	3055
	α Pegasi	E.	53 52 21	3384	52 29 46	3399	51 7 28	3416	49 45 30	3434
22	Antares	W.	65 27 16	3066	66 56 7	3067	68 24 57	3067	69 53 47	3068
	Jupiter	W.	49 47 57	3096	51 16 11	3096	52 44 25	3096	54 12 40	3096

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14	Antares	E.	27° 15′ 56″	2537	25° 35′ 34″	2554	23° 55′ 36″	2572	22° 16′ 2″	2589
	Jupiter	E.	43 22 41	2567	41 43 1	2586	40 3 47	2606	38 25 0	2626
	α Aquilæ	E.	83 12 30	3265	81 47 37	3288	80 23 11	3313	78 59 14	3338
15	Sun	W.	90 46 13	3000	92 16 26	3017	93 46 18	3034	95 15 49	3049
	Venus	W.	63 58 29	3100	65 26 39	3116	66 54 29	3133	68 21 59	3150
	Spica	W.	31 54 47	2677	33 31 58	2691	35 8 50	2705	36 45 23	2720
	Jupiter	E.	30 18 4	2732	28 42 7	2756	27 6 41	2780	25 31 47	2807
	α Aquilæ	E.	72 7 5	3480	70 46 18	3510	69 26 5	3544	68 6 29	3578
16	Sun	W.	102 38 38	3124	104 6 18	3138	105 33 41	3153	107 0 46	3167
	Venus	W.	75 34 38	3226	77 0 16	3242	78 25 36	3255	79 50 40	3270
	Spica	W.	44 43 26	2788	46 18 10	2801	47 52 37	2813	49 26 48	2825
	α Aquilæ	E.	61 38 21	3773	60 22 51	3819	59 8 8	3866	57 54 14	3916
17	Sun	W.	114 12 21	3228	115 37 57	3240	117 3 19	3250	118 28 29	3261
	Venus	W.	86 52 5	3332	88 15 39	3345	89 38 59	3355	91 2 7	3366
	Spica	W.	57 13 53	2882	58 46 35	2892	60 19 4	2901	61 51 21	2912
	α Aquilæ	E.	51 58 6	4212	50 49 51	4284	49 42 44	4361	48 36 47	4441
	Fomalhaut	E.	72 5 38	3915	70 39 47	3932	69 14 16	3950	67 49 6	3967
	Saturn	E.	89 0 28	2863	87 27 22	2874	85 54 30	2884	84 21 51	2894
18	Sun	W.	125 31 19	3309	126 55 20	3317	128 19 12	3325	129 42 55	3333
	Venus	W.	97 54 45	3415	99 16 44	3424	100 38 33	3432	102 0 13	3441
	Spica	W.	69 29 47	2955	71 0 56	2962	72 31 56	2970	74 2 46	2977
	α Aquilæ	E.	43 26 55	4961	42 29 29	5093	41 33 46	5238	40 39 53	5397
	Fomalhaut	E.	60 48 30	3362	59 25 30	3383	58 2 54	3405	56 40 43	3427
	Mars	E.	75 37 53	2935	74 6 19	2944	72 34 56	2951	71 3 42	2958
	Saturn	E.	76 41 33	2938	75 10 2	2946	73 38 41	2953	72 7 29	2961
19	Spica	W.	81 34 50	3009	83 4 52	3014	84 34 48	3019	86 4 37	3024
	Antares	W.	35 40 37	3006	37 10 42	3012	38 40 40	3018	40 10 31	3022
	Fomalhaut	E.	49 56 34	3560	48 37 16	3591	47 18 32	3625	46 0 25	3662
	Mars	E.	63 29 46	2993	61 59 24	2999	60 29 10	3005	58 59 3	3011
	Saturn	E.	64 33 42	2993	63 3 20	2998	61 33 5	3003	60 2 56	3009
	α Pegasi	E.	70 42 27	3241	69 17 6	3250	67 51 56	3261	66 26 59	3271
20	Spica	W.	93 32 20	3043	95 1 39	3047	96 30 53	3051	98 0 3	3053
	Antares	W.	47 38 27	3042	49 7 48	3045	50 37 5	3048	52 6 18	3051
	Jupiter	W.	32 9 21	3099	33 37 32	3098	35 5 44	3098	36 33 56	3097
	Fomalhaut	E.	39 40 38	3897	38 27 15	3958	37 14 54	4027	36 3 41	4103
	Mars	E.	51 30 20	3040	50 0 5	3046	48 31 41	3052	47 2 32	3058
	Saturn	E.	52 33 44	3031	51 4 10	3034	49 34 40	3039	48 5 15	3043
	α Pegasi	E.	59 25 23	3328	58 1 44	3342	56 38 21	3355	55 15 13	3369
21	Antares	W.	59 31 39	3061	61 0 36	3063	62 29 31	3065	63 58 24	3065
	Jupiter	W.	43 55 2	3097	45 23 15	3096	46 51 29	3096	48 19 43	3096
	Mars	E.	39 38 44	3091	38 10 24	3100	36 42 14	3109	35 14 15	3119
	Saturn	E.	40 39 13	3058	39 10 12	3060	37 41 14	3064	36 12 20	3067
	α Pegasi	E.	48 23 52	3454	47 2 36	3474	45 41 43	3497	44 21 15	3522
22	Antares	W.	71 22 36	3068	72 51 25	3068	74 20 14	3068	75 49 3	3068
	Jupiter	W.	55 40 55	3095	57 9 11	3094	58 37 28	3093	60 5 46	3092

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22	Mars	E.	33° 46′ 28″	3129	32° 18′ 54″	3142	30° 51′ 35″	3155	29° 24′ 32″	3171
	α Arietis	E.	82 47 55	3084	81 19 26	3085	79 50 58	3086	78 22 31	3086
23	Antares	W.	77 17 52	3067	78 46 42	3066	80 15 33	3065	81 44 25	3065
	Jupiter	W.	61 34 5	3091	63 2 25	3091	64 30 46	3089	65 59 9	3087
	α Arietis	E.	71 0 20	3087	69 31 54	3087	68 3 28	3086	66 35 1	3086
24	Jupiter	W.	73 21 33	3079	74 50 8	3077	76 18 46	3074	77 47 27	3073
	α Aquilæ	W.	45 35 22	4744	46 35 45	4659	47 37 19	4581	48 40 0	4509
	α Arietis	E.	59 12 35	3081	57 44 2	3080	56 15 28	3078	54 46 52	3078
	Aldebaran	E.	90 57 36	3133	89 30 7	3131	88 2 35	3129	86 35 1	3127
25	Jupiter	W.	85 11 36	3058	86 40 37	3055	88 9 42	3052	89 38 51	3047
	α Aquilæ	W.	54 7 53	4222	55 15 58	4176	56 24 47	4133	57 34 17	4093
	α Arietis	E.	47 24 27	3069	45 54 40	3068	44 25 51	3066	42 57 0	3065
	Aldebaran	E.	79 16 30	3116	77 48 40	3113	76 20 46	3110	74 52 49	3108
26	α Aquilæ	W.	63 30 45	3926	64 43 38	3899	65 56 59	3873	67 10 46	3848
	Aldebaran	E.	67 32 17	3095	66 4 1	3091	64 35 41	3089	63 7 18	3086
27	α Aquilæ	W.	73 25 40	3743	74 41 42	3724	75 58 4	3707	77 14 44	3690
	Fomalhaut	W.	46 59 6	3545	48 18 41	3510	49 38 54	3479	50 59 42	3449
	Mars	W.	28 44 36	3041	30 13 58	3018	31 43 48	2998	33 14 3	2980
	Saturn	W.	25 41 46	2978	27 12 26	2967	28 43 20	2956	30 14 28	2946
	Aldebaran	E.	55 44 31	3073	54 15 48	3070	52 47 2	3069	51 18 14	3067
28	Fomalhaut	W.	57 51 31	3321	59 15 18	3300	60 39 30	3278	62 4 7	3257
	Mars	W.	40 50 42	2901	42 23 0	2886	43 55 37	2872	45 28 32	2859
	Saturn	W.	37 53 25	2894	39 25 51	2883	40 58 31	2873	42 31 24	2863
	Aldebaran	E.	43 53 50	3064	42 24 56	3065	40 56 4	3068	39 27 15	3070
	Pollux	E.	85 50 24	2904	84 18 10	2894	82 45 44	2886	81 13 7	2876
	Sun	E.	129 52 30	3250	128 27 20	3240	127 1 58	3231	125 36 25	3220
29	Fomalhaut	W.	69 13 5	3163	70 39 59	3144	72 7 15	3128	73 34 51	3110
	Mars	W.	53 17 27	2791	54 52 7	2778	56 27 4	2764	58 2 19	2750
	Saturn	W.	50 19 16	2808	51 53 34	2796	53 28 7	2784	55 2 56	2772
	α Pegasi	W.	46 58 11	3211	48 24 7	3181	49 50 39	3153	51 17 45	3126
	Aldebaran	E.	32 4 50	3116	30 37 0	3134	29 9 32	3157	27 42 31	3184
	Pollux	E.	73 26 56	2826	71 53 2	2815	70 18 53	2804	68 44 30	2792
	Sun	E.	118 25 32	3165	116 58 41	3153	115 31 36	3141	114 4 16	3129
30	Fomalhaut	W.	80 57 57	3030	82 27 33	3014	83 57 29	2998	85 27 44	2984
	Mars	W.	66 3 7	2681	67 40 13	2666	69 17 38	2652	70 55 23	2638
	Saturn	W.	63 1 5	2708	64 37 34	2694	66 14 22	2681	67 51 28	2666
	α Pegasi	W.	58 41 2	3004	60 11 10	2982	61 41 45	2961	63 12 47	2939
	Pollux	E.	60 48 42	2732	59 12 44	2718	57 36 28	2705	55 59 55	2692
	Sun	E.	106 43 40	3061	105 14 43	3047	103 45 28	3032	102 15 55	3018
31	Mars	W.	79 9 8	2561	80 48 56	2546	82 29 5	2530	84 9 36	2515
	Saturn	W.	76 1 47	2593	77 40 51	2578	79 20 16	2563	81 0 2	2547
	α Pegasi	W.	70 54 33	2838	72 28 11	2819	74 2 14	2800	75 36 42	2781
	Pollux	E.	47 52 33	2621	46 14 7	2607	44 35 22	2593	42 56 17	2578
	Sun	E.	94 43 27	2939	93 11 58	2923	91 40 8	2906	90 7 57	2890

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22	Mars	E.	27° 57′ 48″	3189	26° 31′ 26″	3210	25° 5′ 29″	3236	23° 40′ 3″	3266
	α Arietis	E.	76 54 4	3087	75 25 38	3087	73 57 12	3087	72 28 46	3087
23	Antares	W.	83 13 18	3063	84 42 13	3062	86 11 9	3060	87 40 7	3058
	Jupiter	W.	67 27 34	3086	68 56 1	3085	70 24 29	3083	71 53 0	3081
	α Arietis	E.	65 6 34	3085	63 38 6	3084	62 9 37	3083	60 41 7	3082
24	Jupiter	W.	79 16 10	3070	80 44 56	3067	82 13 46	3065	83 42 39	3061
	α Aquilæ	W.	49 43 44	4444	50 48 26	4381	51 54 4	4326	53 0 34	4271
	α Arietis	E.	53 18 15	3076	51 49 36	3074	50 20 55	3073	48 52 12	3071
	Aldebaran	E.	85 7 24	3125	83 39 45	3123	82 12 3	3120	80 44 18	3118
25	Jupiter	W.	91 8 5	3043	92 37 24	3040	94 6 47	3036	95 36 15	3031
	α Aquilæ	W.	58 44 25	4055	59 55 10	4021	61 6 29	3987	62 18 21	3955
	α Arietis	E.	41 28 7	3063	39 59 12	3062	38 30 16	3060	37 1 18	3059
	Aldebaran	E.	73 24 49	3105	71 56 46	3103	70 28 40	3100	69 0 30	3097
26	α Aquilæ	W.	68 24 59	3824	69 39 36	3802	70 54 36	3781	72 9 58	3762
	Aldebaran	E.	61 38 51	3083	60 10 21	3081	58 41 48	3078	57 13 11	3075
27	α Aquilæ	W.	78 31 42	3675	79 48 56	3660	81 6 26	3646	82 24 11	3632
	Fomalhaut	W.	52 21 3	3421	53 42 56	3394	55 5 19	3369	56 28 11	3345
	Mars	W.	34 44 41	2962	36 15 41	2946	37 47 2	2930	39 18 43	2916
	Saturn	W.	31 45 49	2935	33 17 23	2924	34 49 11	2914	36 21 12	2905
	Aldebaran	E.	49 49 24	3065	48 20 32	3065	46 51 39	3064	45 22 45	3063
28	Fomalhaut	W.	63 29 9	3237	64 54 34	3218	66 20 22	3199	67 46 32	3180
	Mars	W.	47 1 44	2845	48 35 14	2831	50 9 1	2818	51 43 5	2805
	Saturn	W.	44 4 30	2852	45 37 50	2842	47 11 24	2830	48 45 13	2819
	Aldebaran	E.	37 58 29	3075	36 29 49	3082	35 1 18	3091	33 32 57	3102
	Pollux	E.	79 40 18	2867	78 7 17	2857	76 34 3	2847	75 0 36	2837
	Sun	E.	124 10 40	3209	122 44 42	3199	121 18 32	3188	119 52 9	3177
29	Fomalhaut	W.	75 2 48	3094	76 31 5	3077	77 59 43	3061	79 28 40	3045
	Mars	W	59 37 52	2737	61 13 43	2723	62 49 52	2709	64 26 20	2695
	Saturn	W.	56 38 1	2760	58 13 22	2747	59 48 59	2735	61 24 53	2721
	α Pegasi	W.	52 45 23	3100	54 13 33	3075	55 42 13	3051	57 11 23	3027
	Aldebaran	E.	26 16 3	3220	24 50 18	3265	23 25 26	3322	22 1 40	3396
	Pollux	E.	67 9 52	2780	65 34 58	2769	63 59 49	2756	62 24 24	2744
	Sun	E.	112 36 41	3115	111 8 50	3102	109 40 43	3089	108 12 20	3075
30	Fomalhaut	W.	86 58 17	2969	88 29 9	2954	90 0 20	2939	91 31 49	2925
	Mars	W.	72 33 27	2623	74 11 51	2607	75 50 36	2593	77 29 41	2577
	Saturn	W.	69 28 53	2652	71 6 37	2638	72 44 40	2624	74 23 3	2608
	α Pegasi	W.	64 44 16	2918	66 16 12	2898	67 48 33	2878	69 21 20	2858
	Pollux	E.	54 23 4	2678	52 45 54	2664	51 8 26	2650	49 30 39	2636
	Sun	E.	100 46 4	3002	99 15 54	2987	97 45 25	2971	96 14 36	2955
31	Mars	W.	85 50 28	2499	87 31 42	2483	89 13 19	2467	90 55 19	2451
	Saturn	W.	82 40 10	2532	84 20 39	2515	86 1 31	2499	87 42 45	2483
	α Pegasi	W.	77 11 35	2763	78 46 52	2744	80 22 34	2725	81 58 40	2706
	Pollux	E.	41 16 52	2564	39 37 7	2549	37 57 2	2534	36 16 36	2520
	Sun	E.	88 35 25	2673	87 2 31	2655	85 29 15	2638	83 55 37	2621

SEPTEMBER, 1877.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 hour.	THE SUN'S Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be subtracted from Apparent Time.*	Diff. for 1 hour
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	10 42 47.42	9.067	N. 8 9 46.3	−54.59	15 53.77	64.40	0 13.42	0.787
Sun.	2	10 46 24.91	9.056	7 47 52.3	54.92	15 54.00	64.35	0 32.43	0.798
Mon.	3	10 50 2.15	9.046	7 25 50.6	55.23	15 54.23	64.31	0 51.69	0.808
Tues.	4	10 53 39.15	9.037	7 3 41.6	55.53	15 54.46	64.27	1 11.19	0.817
Wed.	5	10 57 15.93	9.028	6 41 25.5	55.81	15 54.70	64.24	1 30.91	0.826
Thur.	6	11 0 52.50	9.019	6 19 2.7	56.08	15 54.94	64.21	1 50.85	0.835
Frid.	7	11 4 28.86	9.011	5 56 33.6	56.34	15 55.18	64.18	2 10.98	0.843
Sat.	8	11 8 5.04	9.004	5 33 58.7	56.57	15 55.43	64.15	2 31.30	0.850
Sun.	9	11 11 41.04	8.997	5 11 18.1	56.80	15 55.68	64.13	2 51.80	0.857
Mon.	10	11 15 16.90	8.991	4 48 32.3	57.02	15 55.94	64.11	3 12.44	0.863
Tues.	11	11 18 52.62	8.986	4 25 41.7	57.20	15 56.20	64.09	3 33.21	0.868
Wed.	12	11 22 28.22	8.983	4 2 46.4	57.38	15 56.46	64.08	3 54.10	0.873
Thur.	13	11 26 3.72	8.977	3 39 46.9	57.55	15 56.72	64.07	4 15.09	0.877
Frid.	14	11 29 39.13	8.974	3 16 43.7	57.70	15 56.98	64.06	4 36.18	0.880
Sat.	15	11 33 14.49	8.972	2 53 37.1	57.84	15 57.25	64.06	4 57.32	0.882
Sun.	16	11 36 49.79	8.971	2 30 27.1	57.97	15 57.52	64.06	5 18.51	0.883
Mon.	17	11 40 25.08	8.970	2 7 14.3	58.08	15 57.79	64.06	5 39.72	0.884
Tues.	18	11 44 0.37	8.970	1 43 59.0	58.18	15 58.06	64.06	6 0.93	0.884
Wed.	19	11 47 35.66	8.971	1 20 41.5	58.26	15 58.33	64.07	6 22.13	0.883
Thur.	20	11 51 10.99	8.974	0 57 22.1	58.34	15 58.60	64.08	6 43.29	0.880
Frid.	21	11 54 46.39	8.977	0 34 1.2	58.40	15 58.87	64.09	7 4.39	0.877
Sat.	22	11 58 21.88	8.981	N. 0 10 38.9	58.45	15 59.14	64.10	7 25.41	0.873
Sun.	23	12 1 57.48	8.986	S. 0 12 44.3	58.48	15 59.41	64.12	7 46.31	0.868
Mon.	24	12 5 33.22	8.993	0 36 8.2	58.50	15 59.68	64.14	8 7.06	0.861
Tues.	25	12 9 9.12	9.000	0 59 32.3	58.51	15 59.95	64.17	8 27.65	0.854
Wed.	26	12 12 45.20	9.008	1 22 56.5	58.50	16 0.22	64.19	8 48.07	0.846
Thur.	27	12 16 21.48	9.017	1 46 20.4	58.48	16 0.49	64.22	9 8.28	0.837
Frid.	28	12 19 57.99	9.027	2 9 43.7	58.44	16 0.76	64.25	9 28.27	0.827
Sat.	29	12 23 34.76	9.038	2 33 6.0	58.39	16 1.03	64.29	9 48.01	0.816
Sun.	30	12 27 11.81	9.050	2 56 26.9	58.33	16 1.30	64.33	10 7.47	0.804
Mon.	31	12 30 49.26	9.062	S. 3 19 46.1	−58.26	16 1.57	64.37	10 26.62	0.792

Note.—Mean Time of the Semidiameter passing may be found by subtracting $0^{\mathrm{s}}.18$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S *Apparent* Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S *Apparent* Declination.	THE SUN'S Diff. for 1 hour.	Equation of Time, *to be added to Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	10 42 47.43	9.069	N. 8 9 46.3	-54.60	0 13.42	0.787	10 43 0.85
Sun.	2	10 46 24.97	9.058	7 47 52.0	54.93	0 32.44	0.798	10 46 57.41
Mon.	3	10 50 2.26	9.048	7 25 49.9	55.24	0 51.70	0.808	10 50 53.96
Tues.	4	10 53 39.31	9.039	7 3 40.6	55.54	1 11.21	0.817	10 54 50.52
Wed.	5	10 57 16.14	9.030	6 41 24.2	55.82	1 30.93	0.826	10 58 47.07
Thur.	6	11 0 52.76	9.021	6 19 1.1	56.09	1 50.87	0.835	11 2 43.63
Frid.	7	11 4 29.17	9.013	5 56 31.7	56.35	2 11.01	0.843	11 6 40.18
Sat.	8	11 8 5.40	9.006	5 33 56.4	56.58	2 31.33	0.850	11 10 36.73
Sun.	9	11 11 41.45	8.999	5 11 15.5	56.81	2 51.83	0.857	11 14 33.28
Mon.	10	11 15 17.36	8.993	4 48 29.4	57.03	3 12.48	0.863	11 18 29.84
Tues.	11	11 18 53.13	8.988	4 25 38.4	57.22	3 33.26	0.868	11 22 26.39
Wed.	12	11 22 28.78	8.983	4 2 42.8	57.40	3 54.16	0.873	11 26 22.94
Thur.	13	11 26 4.33	8.979	3 39 43.0	57.57	4 15.16	0.877	11 30 19.49
Frid.	14	11 29 39.80	8.976	3 16 39.4	57.72	4 36.25	0.880	11 34 16.05
Sat.	15	11 33 15.21	8.974	2 53 32.4	57.86	4 57.39	0.882	11 38 12.60
Sun.	16	11 36 50.57	8.973	2 30 22.1	57.99	5 18.59	0.883	11 42 9.16
Mon.	17	11 40 25.91	8.972	2 7 8.9	58.10	5 39.80	0.884	11 46 5.71
Tues.	18	11 44 1.25	8.972	1 43 53.2	58.20	6 1.02	0.884	11 50 2.27
Wed.	19	11 47 36.59	8.973	1 20 35.4	58.28	6 22.23	0.883	11 53 58.82
Thur.	20	11 51 11.96	8.976	0 57 15.7	58.36	6 43.40	0.880	11 57 55.38
Frid.	21	11 54 47.44	8.979	0 33 54.4	58.42	7 4.49	0.877	12 1 51.93
Sat.	22	11 58 22.97	8.983	N. 0 10 31.8	58.47	7 25.52	0.873	12 5 48.49
Sun.	23	12 1 58.62	8.988	S. 0 12 51.8	58.50	7 46.42	0.868	12 9 45.04
Mon.	24	12 5 34.42	8.995	0 36 16.0	58.52	8 7.17	0.861	12 13 41.59
Tues.	25	12 9 10.37	9.002	0 59 40.5	58.53	8 27.77	0.854	12 17 38.14
Wed.	26	12 12 46.50	9.010	1 23 5.0	58.52	8 48.20	0.846	12 21 34.70
Thur.	27	12 16 22.84	9.019	1 46 29.2	58.50	9 8.41	0.837	12 25 31.25
Frid.	28	12 19 59.40	9.029	2 9 52.8	58.46	9 28.41	0.827	12 29 27.81
Sat.	29	12 23 36.22	9.040	2 33 15.4	58.41	9 48.14	0.816	12 33 24.36
Sun.	30	12 27 13.32	9.052	2 56 36.6	58.35	10 7.60	0.804	12 37 20.92
Mon.	31	12 30 50.72	9.064	S. 3 19 56.2	-58.27	10 26.75	0.792	12 41 17.47

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^s.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	THE SUN'S *True* LONGITUDE. λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	244	159 6 32.2	5 49.7	145.32	+0.53	0.0037312	−42.9	13 14 48.57
2	245	160 4 40.9	3 58.2	145.40	0.45	.0036275	43.5	13 10 52.66
3	246	161 2 51.6	2 8.8	145.49	0.36	.0035225	44.0	13 6 56.75
4	247	162 1 4.3	0 21.4	145.57	0.24	.0034161	44.6	13 3 0.86
5	248	162 59 18.8	58 35.8	145.65	+0.11	.0033082	45.2	12 59 4.95
6	249	163 57 35.2	56 52.1	145.73	−0.03	.0031987	45.9	12 55 9.04
7	250	164 55 53.5	55 10.2	145.80	0.16	.0030876	46.6	12 51 13.13
8	251	165 54 13.6	53 30.2	145.88	0.30	.0029750	47.2	12 47 17.23
9	252	166 52 35.5	51 52.0	145.95	0.41	.0028609	47.8	12 43 21.32
10	253	167 50 59.2	50 15.6	146.02	0.52	.0027454	48.4	12 39 25.40
11	254	168 49 24.6	48 40.9	146.09	0.59	.0026284	49.0	12 35 29.50
12	255	169 47 51.6	47 7.8	146.16	0.63	.0025102	49.5	12 31 33.60
13	256	170 46 20.3	45 36.3	146.23	0.64	.0023909	49.9	12 27 37.69
14	257	171 44 50.7	44 6.6	146.30	0.63	.0022707	50.3	12 23 41.78
15	258	172 43 22.7	42 38.5	146.36	0.58	.0021497	50.6	12 19 45.87
16	259	173 41 56.2	41 11.9	146.43	0.52	.0020279	50.8	12 15 49.97
17	260	174 40 31.3	39 46.9	146.50	0.44	.0019057	51.0	12 11 54.06
18	261	175 39 8.1	38 23.6	145.57	0.32	.0017831	51.1	12 7 58.15
19	262	176 37 46.8	37 2.2	146.65	0.20	.0016602	51.2	12 4 2.25
20	263	177 36 27.3	35 42.6	146.72	−0.07	.0015373	51.2	12 0 6.33
21	264	178 35 9.6	34 24.8	146.80	+0.06	.0014145	51.1	11 56 10.42
22	265	179 33 53.8	33 8.8	146.88	0.17	.0012919	51.0	11 52 14.51
23	266	180 32 40.0	31 54.9	146.97	0.26	.0011694	51.0	11 48 18.60
24	267	181 31 28.3	30 43.1	147.05	0.35	.0010469	51.0	11 44 22.70
25	268	182 30 18.6	29 33.3	147.14	0.40	.0009246	50.9	11 40 26.79
26	269	183 29 11.1	28 25.7	147.23	0.41	.0008026	50.9	11 36 30.88
27	270	184 28 5.8	27 20.3	147.33	0.41	.0006806	50.8	11 32 34.97
28	271	185 27 2.8	26 17.2	147.42	0.37	.0005586	50.8	11 28 39.07
29	272	186 26 2.1	25 16.4	147.52	0.31	.0004366	50.8	11 24 43.16
30	273	187 25 3.7	24 17.9	147.61	0.21	.0003145	50.9	11 20 47.25
31	274	188 24 7.7	23 21.8	147.71	+0.11	0.0001921	−51.1	11 16 51.35

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour. —9s.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 49.5	15 56.5	57 58.1	+2.14	58 24.0	+2.17	19 3.4	2.56	23.3
2	16 3.7	16 10.7	58 50.1	2.17	59 15.8	2.11	20 5.3	2.58	24.3
3	16 17.4	16 23.7	59 40.5	2.00	60 3.6	1.84	21 6.5	2.50	25.3
4	16 29.4	16 34.3	60 24.5	1.62	60 42.4	1.36	22 5.2	2.38	26.3
5	16 38.2	16 41.0	60 56.9	1.04	61 7.3	+0.69	23 0.8	2.25	27.3
6	16 42.7	16 43.0	61 13.3	+0.30	61 14.4	−0.11	23 53.6	2.16	28.3
7	16 42.0	16 39.6	61 10.7	−0.51	61 2.2	0.90	☌		29.3
8	16 36.1	16 31.4	60 49.2	1.26	60 32.0	1.59	0 44.7	2.11	1.0
9	16 25.7	16 19.3	60 11.2	1.87	59 47.4	2.09	1 35.3	2.12	2.0
10	16 12.2	16 4.6	59 21.3	2.25	58 53.7	2.35	2 26.6	2.16	3.0
11	15 56.9	15 49.0	58 25.1	2.40	57 56.3	2.39	3 19.2	2.23	4.0
12	15 41.3	15 33.9	57 28.0	2.33	57 0.6	2.24	4 13.4	2.29	5.0
13	15 26.7	15 20.0	56 34.4	2.12	56 9.9	1.97	5 8.5	2.31	6.0
14	15 13.9	15 8.3	55 47.3	1.80	55 26.8	1.62	6 3.6	2.27	7.0
15	15 3.3	14 59.0	55 8.5	1.43	54 52.5	1.24	6 57.1	2.18	8.0
16	14 55.3	14 52.2	54 38.8	1.05	54 27.4	0.86	7 48.0	2.05	9.0
17	14 49.6	14 47.7	54 18.2	0.67	54 11.2	0.50	8 35.7	1.92	10.0
18	14 46.4	14 45.6	54 6.3	0.32	54 3.4	−0.16	9 20.4	1.80	11.0
19	14 45.3	14 45.5	54 2.4	−0.01	54 3.1	+0.12	10 2.6	1.71	12.0
20	14 46.2	14 47.2	54 5.4	+0.25	54 9.1	0.37	10 43.0	1.66	13.0
21	14 48.5	14 50.3	54 14.2	0.48	54 20.5	0.58	11 22.6	1.64	14.0
22	14 52.3	14 54.6	54 28.0	0.67	54 36.5	0.76	12 2.3	1.67	15.0
23	14 57.3	15 0.1	54 46.1	0.84	54 56.6	0.92	12 43.2	1.74	16.0
24	15 3.2	15 6.6	55 8.1	0.99	55 20.4	1.07	13 26.3	1.86	17.0
25	15 10.2	15 14.0	55 33.7	1.15	55 47.9	1.22	14 12.6	2.01	18.0
26	15 18.2	15 22.5	56 3.0	1.30	56 19.1	1.38	15 2.9	2.18	19.0
27	15 27.1	15 32.0	56 36.0	1.45	56 53.8	1.52	15 57.3	2.35	20.0
28	15 37.0	15 42.3	57 12.4	1.58	57 31.7	1.64	16 55.2	2.47	21.0
29	15 47.7	15 53.3	57 51.6	1.68	58 11.9	1.71	17 54.9	2.50	22.0
30	15 58.9	16 4.4	58 32.5	1.71	58 53.0	1.68	18 54.4	2.45	23.0
31	16 9.8	16 15.0	59 12.8	+1.63	59 31.8	−1.53	19 52.0	2.34	24.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 0 14.40	2.5425	N.27 52 49.1	2.668
1	5 2 47.11	2.5477	27 55 24.0	2.496
2	5 5 20.12	2.5527	27 57 48.6	2.323
3	5 7 53.44	2.5577	28 0 2.8	2.149
4	5 10 27.05	2.5626	28 2 6.5	1.973
5	5 13 0.95	2.5673	28 3 59.6	1.797
6	5 15 35.13	2.5719	28 5 42.1	1.620
7	5 18 9.58	2.5764	28 7 14.0	1.442
8	5 20 44.30	2.5808	28 8 35.1	1.262
9	5 23 19.28	2.5851	28 9 45.4	1.082
10	5 25 54.51	2.5891	28 10 44.9	0.901
11	5 28 29.97	2.5930	28 11 33.5	0.719
12	5 31 5.67	2.5968	28 12 11.2	0.537
13	5 33 41.59	2.6005	28 12 37.9	0.353
14	5 36 17.73	2.6041	28 12 53.5	+0.168
15	5 38 54.08	2.6075	28 12 58.1	−0.016
16	5 41 30.63	2.6107	28 12 51.6	0.202
17	5 44 7.37	2.6138	28 12 33.9	0.389
18	5 46 44.29	2.6168	28 12 4.9	0.577
19	5 49 21.38	2.6196	28 11 24.7	0.764
20	5 51 58.64	2.6222	28 10 33.2	0.952
21	5 54 36.05	2.6247	28 9 30.4	1.141
22	5 57 13.60	2.6270	28 8 16.3	1.329
23	5 59 51.29	2.6292	N.28 6 50.9	1.518

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 2 29.11	2.6313	N.28 5 14.1	1.709
1	6 5 7.05	2.6332	28 3 25.8	1.901
2	6 7 45.09	2.6348	28 1 26.0	2.092
3	6 10 23.23	2.6364	27 59 14.8	2.283
4	6 13 1.46	2.6378	27 56 52.1	2.474
5	6 15 39.77	2.6391	27 54 17.9	2.666
6	6 18 18.15	2.6402	27 51 32.2	2.858
7	6 20 56.59	2.6411	27 48 35.0	3.050
8	6 23 35.08	2.6419	27 45 26.2	3.242
9	6 26 13.62	2.6426	27 42 5.9	3.435
10	6 28 52.19	2.6430	27 38 34.0	3.627
11	6 31 30.78	2.6432	27 34 50.6	3.819
12	6 34 9.38	2.6434	27 30 55.7	4.012
13	6 36 47.99	2.6435	27 26 49.2	4.204
14	6 39 26.60	2.6433	27 22 31.2	4.396
15	6 42 5.19	2.6430	27 18 1.7	4.588
16	6 44 43.76	2.6426	27 13 20.6	4.781
17	6 47 22.30	2.6419	27 8 28.0	4.972
18	6 50 0.79	2.6412	27 3 24.0	5.163
19	6 52 39.24	2.6403	26 58 8.5	5.354
20	6 55 17.63	2.6393	26 52 41.5	5.545
21	6 57 55.95	2.6381	26 47 3.1	5.735
22	7 0 34.20	2.6367	26 41 13.3	5.925
23	7 3 12.36	2.6352	26 35 12.1	6.115
24	7 5 50.42	2.6335	N.26 28 59.5	6.304

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 5 50.42	2.6335	N.26 28 59.5	6.304
1	7 8 28.38	2.6318	26 22 35.6	6.492
2	7 11 6.24	2.6300	26 16 0.5	6.679
3	7 13 43.98	2.6279	26 9 14.1	6.867
4	7 16 21.59	2.6257	26 2 16.5	7.053
5	7 18 59.07	2.6235	25 55 7.7	7.239
6	7 21 36.41	2.6211	25 47 47.8	7.424
7	7 24 13.60	2.6186	25 40 16.8	7.608
8	7 26 50.64	2.6159	25 32 34.8	7.791
9	7 29 27.51	2.6131	25 24 41.9	7.973
10	7 32 4.21	2.6102	25 16 38.0	8.156
11	7 34 40.74	2.6072	25 8 23.2	8.337
12	7 37 17.08	2.6041	24 59 57.6	8.517
13	7 39 53.23	2.6009	24 51 21.2	8.696
14	7 42 29.19	2.5976	24 42 34.2	8.873
15	7 45 4.94	2.5941	24 33 36.5	9.050
16	7 47 40.48	2.5906	24 24 28.2	9.225
17	7 50 15.81	2.5870	24 15 9.5	9.398
18	7 52 50.92	2.5832	24 5 40.4	9.572
19	7 55 25.80	2.5794	23 56 0.9	9.744
20	7 58 0.45	2.5756	23 46 11.1	9.915
21	8 0 34.87	2.5717	23 36 11.1	10.084
22	8 3 9.05	2.5676	23 26 1.0	10.252
23	8 5 42.98	2.5634	N.23 15 40.8	10.420

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 8 16.66	2.5592	N.23 5 10.6	10.586
1	8 10 50.09	2.5550	22 54 30.5	10.749
2	8 13 23.26	2.5506	22 43 40.7	10.911
3	8 15 56.16	2.5462	22 32 41.2	11.073
4	8 18 28.80	2.5417	22 21 32.0	11.233
5	8 21 1.17	2.5372	22 10 13.3	11.391
6	8 23 33.27	2.5327	21 58 45.1	11.548
7	8 26 5.09	2.5280	21 47 7.6	11.703
8	8 28 36.63	2.5233	21 35 20.8	11.857
9	8 31 7.89	2.5187	21 23 24.8	12.009
10	8 33 38.87	2.5140	21 11 19.7	12.159
11	8 36 9.57	2.5092	20 59 5.7	12.306
12	8 38 39.98	2.5043	20 46 42.8	12.455
13	8 41 10.09	2.4994	20 34 11.1	12.600
14	8 43 39.91	2.4946	20 21 30.8	12.743
15	8 46 9.44	2.4897	20 8 41.9	12.886
16	8 48 38.67	2.4847	19 55 44.5	13.026
17	8 51 7.60	2.4797	19 42 38.8	13.164
18	8 53 36.23	2.4747	19 29 24.8	13.301
19	8 56 4.56	2.4698	19 16 2.7	13.435
20	8 58 32.60	2.4648	19 2 32.6	13.568
21	9 1 0.34	2.4597	18 48 54.5	13.700
22	9 3 27.77	2.4547	18 35 8.6	13.828
23	9 5 54.90	2.4497	18 21 15.1	13.955
24	9 8 21.74	2.4448	N.18 7 14.0	14.081

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 8 21.74	2.4448	N.18 7 14.0	14.081
1	9 10 48.28	2.4398	17 53 5.4	14.204
2	9 13 14.51	2.4347	17 38 49.5	14.326
3	9 15 40.44	2.4297	17 24 26.3	14.446
4	9 18 6.07	2.4247	17 9 56.0	14.563
5	9 20 31.40	2.4197	16 55 18.7	14.679
6	9 22 56.44	2.4148	16 40 34.5	14.792
7	9 25 21.18	2.4098	16 25 43.6	14.904
8	9 27 45.62	2.4049	16 10 46.0	15.014
9	9 30 9.77	2.4001	15 55 41.9	15.122
10	9 32 33.63	2.3952	15 40 31.4	15.227
11	9 34 57.19	2.3903	15 25 14.7	15.330
12	9 37 20.46	2.3855	15 9 51.8	15.432
13	9 39 43.45	2.3807	14 54 22.8	15.532
14	9 42 6.15	2.3759	14 38 48.0	15.628
15	9 44 28.56	2.3712	14 23 7.4	15.724
16	9 46 50.69	2.3666	14 7 21.1	15.817
17	9 49 12.55	2.3620	13 51 29.3	15.907
18	9 51 34.13	2.3574	13 35 32.2	15.996
19	9 53 55.44	2.3528	13 19 29.8	16.083
20	9 56 16.47	2.3482	13 3 22.2	16.169
21	9 58 37.23	2.3438	12 47 9.5	16.252
22	10 0 57.73	2.3394	12 30 51.9	16.332
23	10 3 17.96	2.3350	N.12 14 29.6	16.410

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 5 37.93	2.3307	N.11 58 2.7	16.487
1	10 7 57.65	2.3265	11 41 31.2	16.561
2	10 10 17.11	2.3223	11 24 55.4	16.633
3	10 12 36.32	2.3182	11 8 15.3	16.703
4	10 14 55.29	2.3142	10 51 31.0	16.771
5	10 17 14.02	2.3101	10 34 42.8	16.836
6	10 19 32.50	2.3061	10 17 50.7	16.900
7	10 21 50.75	2.3022	10 0 54.8	16.962
8	10 24 8.77	2.2984	9 43 55.3	17.020
9	10 26 26.56	2.2947	9 26 52.4	17.077
10	10 28 44.13	2.2909	9 9 46.1	17.132
11	10 31 1.47	2.2872	8 52 36.5	17.185
12	10 33 18.59	2.2836	8 35 23.9	17.236
13	10 35 35.50	2.2802	8 18 8.3	17.284
14	10 37 52.21	2.2767	8 0 49.8	17.331
15	10 40 8.71	2.2733	7 43 28.6	17.375
16	10 42 25.01	2.2700	7 26 4.8	17.417
17	10 44 41.11	2.2668	7 8 38.6	17.457
18	10 46 57.02	2.2637	6 51 10.0	17.495
19	10 49 12.75	2.2606	6 33 39.2	17.531
20	10 51 28.29	2.2575	6 16 6.3	17.564
21	10 53 43.65	2.2546	5 58 31.5	17.596
22	10 55 58.84	2.2517	5 40 54.8	17.625
23	10 58 13.86	2.2489	5 23 16.5	17.652
24	11 0 28.71	2.2462	N. 5 5 36.6	17.677

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 0 28.71	2.2462	N. 5 5 36.6	17.677
1	11 2 43.40	2.2436	4 47 55.3	17.700
2	11 4 57.94	2.2410	4 30 12.6	17.722
3	11 7 12.32	2.2385	4 12 28.7	17.741
4	11 9 26.56	2.2361	3 54 43.7	17.758
5	11 11 40.66	2.2337	3 36 57.8	17.773
6	11 13 54.61	2.2314	3 19 11.0	17.786
7	11 16 8.43	2.2293	3 1 23.5	17.796
8	11 18 22.13	2.2272	2 43 35.5	17.804
9	11 20 35.70	2.2252	2 25 47.0	17.811
10	11 22 49.15	2.2232	2 7 58.2	17.816
11	11 25 2.49	2.2213	1 50 9.1	17.819
12	11 27 15.71	2.2195	1 32 19.9	17.820
13	11 29 28.83	2.2178	1 14 30.7	17.818
14	11 31 41.85	2.2162	0 56 41.7	17.814
15	11 33 54.78	2.2147	0 38 53.0	17.808
16	11 36 7.62	2.2132	0 21 4.7	17.801
17	11 38 20.37	2.2118	N. 0 3 16.9	17.792
18	11 40 33.04	2.2105	S. 0 14 30.3	17.780
19	11 42 45.63	2.2093	0 32 16.7	17.767
20	11 44 58.15	2.2082	0 50 2.3	17.752
21	11 47 10.61	2.2071	1 7 46.9	17.734
22	11 49 23.00	2.2061	1 25 30.4	17.715
23	11 51 35.34	2.2052	S. 1 43 12.7	17.693

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 53 47.62	2.2043	S. 2 0 53.6	17.670
1	11 55 59.85	2.2035	2 18 33.1	17.645
2	11 58 12.04	2.2029	2 36 11.0	17.618
3	12 0 24.20	2.2023	2 53 47.3	17.590
4	12 2 36.32	2.2017	3 11 21.8	17.559
5	12 4 48.41	2.2012	3 28 54.4	17.526
6	12 7 0.47	2.2008	3 46 24.9	17.491
7	12 9 12.51	2.2005	4 3 53.3	17.455
8	12 11 24.53	2.2003	4 21 19.5	17.417
9	12 13 36.55	2.2002	4 38 43.4	17.377
10	12 15 48.56	2.2002	4 56 4.8	17.335
11	12 18 0.57	2.2001	5 13 23.6	17.292
12	12 20 12.57	2.2001	5 30 39.8	17.247
13	12 22 24.58	2.2003	5 47 53.2	17.199
14	12 24 36.61	2.2006	6 5 3.7	17.150
15	12 26 48.65	2.2008	6 22 11.2	17.099
16	12 29 0.71	2.2012	6 39 15.6	17.047
17	12 31 12.79	2.2015	6 56 16.8	16.993
18	12 33 24.89	2.2019	7 13 14.7	16.937
19	12 35 37.02	2.2025	7 30 9.2	16.879
20	12 37 49.19	2.2032	7 47 0.2	16.819
21	12 40 1.41	2.2040	8 3 47.5	16.758
22	12 42 13.67	2.2047	8 20 31.1	16.696
23	12 44 25.97	2.2054	8 37 11.0	16.632
24	12 46 38.32	2.2062	S. 8 53 46.9	16.565

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 46 38.32	2.2062	S. 8 53 46.9	16.565
1	12 48 50.72	2.2072	9 10 18.8	16.497
2	12 51 3.18	2.2083	9 26 46.6	16.428
3	12 53 15.71	2.2094	9 43 10.2	16.357
4	12 55 28.31	2.2106	9 59 29.5	16.285
5	12 57 40.98	2.2117	10 15 44.4	16.210
6	12 59 53.72	2.2129	10 31 54.7	16.134
7	13 2 6.53	2.2143	10 48 0.4	16.057
8	13 4 19.43	2.2157	11 4 1.5	15.979
9	13 6 32.41	2.2171	11 19 57.9	15.899
10	13 8 45.48	2.2186	11 35 49.4	15.817
11	13 10 58.64	2.2201	11 51 35.9	15.733
12	13 13 11.89	2.2217	12 7 17.3	15.648
13	13 15 25.24	2.2233	12 22 53.6	15.562
14	13 17 38.69	2.2250	12 38 24.7	15.474
15	13 19 52.24	2.2267	12 53 50.5	15.385
16	13 22 5.90	2.2285	13 9 10.9	15.294
17	13 24 19.66	2.2303	13 24 25.8	15.201
18	13 26 33.53	2.2322	13 39 35.0	15.107
19	13 28 47.52	2.2341	13 54 38.6	15.012
20	13 31 1.62	2.2360	14 9 36.5	14.916
21	13 33 15.84	2.2381	14 24 28.5	14.818
22	13 35 30.19	2.2402	14 39 14.6	14.719
23	13 37 44.66	2.2422	S. 14 53 54.8	14.619

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 39 59.25	2.2443	S. 15 8 28.9	14.517
1	13 42 13.97	2.2464	15 22 56.8	14.413
2	13 44 28.82	2.2487	15 37 18.5	14.309
3	13 46 43.81	2.2509	15 51 33.9	14.203
4	13 48 58.93	2.2531	16 5 42.9	14.096
5	13 51 14.18	2.2553	16 19 45.4	13.987
6	13 53 29.57	2.2577	16 33 41.3	13.877
7	13 55 45.10	2.2600	16 47 30.6	13.767
8	13 58 0.77	2.2624	17 1 13.3	13.655
9	14 0 16.59	2.2648	17 14 49.2	13.542
10	14 2 32.55	2.2672	17 28 18.3	13.428
11	14 4 48.65	2.2696	17 41 40.5	13.311
12	14 7 4.90	2.2721	17 54 55.6	13.193
13	14 9 21.30	2.2745	18 8 3.7	13.076
14	14 11 37.84	2.2769	18 21 4.7	12.957
15	14 13 54.53	2.2794	18 33 58.5	12.836
16	14 16 11.37	2.2819	18 46 45.0	12.714
17	14 18 28.36	2.2844	18 59 24.2	12.592
18	14 20 45.50	2.2870	19 11 56.1	12.469
19	14 23 2.80	2.2896	19 24 20.5	12.344
20	14 25 20.25	2.2921	19 36 37.4	12.218
21	14 27 37.85	2.2946	19 48 46.7	12.092
22	14 29 55.60	2.2971	20 0 48.4	11.964
23	14 32 13.50	2.2996	20 12 42.4	11.835
24	14 34 31.55	2.3021	S. 20 24 28.6	11.705

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 34 31.55	2.3021	S. 20 24 28.6	11.705
1	14 36 49.75	2.3046	20 36 7.0	11.574
2	14 39 8.10	2.3072	20 47 37.5	11.442
3	14 41 26.61	2.3097	20 59 0.1	11.310
4	14 43 45.27	2.3122	21 10 14.7	11.177
5	14 46 4.08	2.3147	21 21 21.3	11.043
6	14 48 23.03	2.3171	21 32 19.8	10.907
7	14 50 42.13	2.3196	21 43 10.1	10.770
8	14 53 1.38	2.3220	21 53 52.2	10.633
9	14 55 20.77	2.3244	22 4 26.1	10.496
10	14 57 40.31	2.3268	22 14 51.7	10.357
11	14 59 59.99	2.3293	22 25 8.9	10.217
12	15 2 19.82	2.3317	22 35 17.7	10.076
13	15 4 39.79	2.3339	22 45 18.0	9.935
14	15 6 59.89	2.3362	22 55 9.9	9.794
15	15 9 20.13	2.3384	23 4 53.3	9.652
16	15 11 40.50	2.3407	23 14 28.1	9.508
17	15 14 1.01	2.3429	23 23 54.2	9.363
18	15 16 21.65	2.3450	23 33 11.7	9.219
19	15 18 42.41	2.3471	23 42 20.5	9.073
20	15 21 3.30	2.3492	23 51 20.5	8.928
21	15 23 24.32	2.3513	24 0 11.8	8.782
22	15 25 45.46	2.3533	24 8 54.3	8.634
23	15 28 6.71	2.3552	S. 24 17 27.9	8.486

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 30 28.08	2.3571	S. 24 25 52.6	8.337
1	15 32 49.56	2.3589	24 34 8.4	8.188
2	15 35 11.15	2.3607	24 42 15.2	8.038
3	15 37 32.85	2.3625	24 50 13.0	7.888
4	15 39 54.65	2.3642	24 58 1.8	7.738
5	15 42 16.55	2.3658	25 5 41.6	7.587
6	15 44 38.55	2.3674	25 13 12.3	7.436
7	15 47 0.64	2.3689	25 20 33.9	7.283
8	15 49 22.82	2.3704	25 27 46.3	7.131
9	15 51 45.09	2.3718	25 34 49.6	6.978
10	15 54 7.44	2.3731	25 41 43.7	6.825
11	15 56 29.86	2.3744	25 48 28.6	6.672
12	15 58 52.36	2.3756	25 55 4.3	6.518
13	16 1 14.93	2.3767	26 1 30.7	6.363
14	16 3 37.56	2.3777	26 7 47.9	6.209
15	16 6 0.26	2.3787	26 13 55.8	6.054
16	16 8 23.01	2.3797	26 19 54.4	5.899
17	16 10 45.82	2.3806	26 25 43.7	5.744
18	16 13 8.68	2.3813	26 31 23.7	5.588
19	16 15 31.58	2.3820	26 36 54.3	5.433
20	16 17 54.52	2.3826	26 42 15.6	5.277
21	16 20 17.49	2.3831	26 47 27.5	5.120
22	16 22 40.49	2.3835	26 52 30.0	4.964
23	16 25 3.51	2.3839	26 57 23.2	4.808
24	16 27 26.56	2.3842	S. 27 2 7.0	4.652

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 27 26.56	2.3842	S.27 2 7.0	4.652
1	16 29 49.62	2.3844	27 6 41.4	4.495
2	16 32 12.69	2.3846	27 11 6.4	4.337
3	16 34 35.77	2.3847	27 15 21.9	4.180
4	16 36 58.85	2.3846	27 19 28.0	4.023
5	16 39 21.92	2.3844	27 23 24.7	3.867
6	16 41 44.98	2.3842	27 27 12.1	3.711
7	16 44 8.03	2.3839	27 30 50.1	3.554
8	16 46 31.05	2.3836	27 34 18.6	3.397
9	16 48 54.05	2.3831	27 37 37.7	3.240
10	16 51 17.02	2.3825	27 40 47.4	3.083
11	16 53 39.95	2.3818	27 43 47.7	2.927
12	16 56 2.83	2.3810	27 46 38.6	2.770
13	16 58 25.67	2.3802	27 49 20.1	2.614
14	17 0 48.46	2.3793	27 51 52.3	2.458
15	17 3 11.19	2.3783	27 54 15.1	2.302
16	17 5 33.86	2.3772	27 56 28.6	2.147
17	17 7 56.45	2.3759	27 58 32.7	1.991
18	17 10 18.97	2.3747	28 0 27.5	1.836
19	17 12 41.41	2.3733	28 2 13.0	1.681
20	17 15 3.77	2.3719	28 3 49.2	1.526
21	17 17 26.04	2.3703	28 5 16.1	1.372
22	17 19 48.21	2.3687	28 6 33.8	1.218
23	17 22 10.28	2.3670	S.28 7 42.3	1.064

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 24 32.25	2.3652	S.28 8 41.5	0.910
1	17 26 54.10	2.3638	28 9 31.5	0.757
2	17 29 15.83	2.3618	28 10 12.4	0.605
3	17 31 37.45	2.3592	28 10 44.1	0.452
4	17 33 58.94	2.3570	28 11 6.7	0.301
5	17 36 20.29	2.3547	28 11 20.2	–0.149
6	17 38 41.50	2.3523	28 11 24.6	+0.002
7	17 41 2.57	2.3499	28 11 19.9	0.153
8	17 43 23.49	2.3474	28 11 6.2	0.303
9	17 45 44.26	2.3448	28 10 43.6	0.452
10	17 48 4.87	2.3422	28 10 12.0	0.601
11	17 50 25.32	2.3394	28 9 31.5	0.750
12	17 52 45.60	2.3365	28 8 42.0	0.898
13	17 55 5.70	2.3336	28 7 43.7	1.045
14	17 57 25.63	2.3307	28 6 36.6	1.192
15	17 59 45.38	2.3276	28 5 20.6	1.339
16	18 2 4.94	2.3243	28 3 55.9	1.484
17	18 4 24.30	2.3211	28 2 22.5	1.629
18	18 6 43.47	2.3178	28 0 40.4	1.774
19	18 9 2.44	2.3144	27 58 49.6	1.918
20	18 11 21.20	2.3110	27 56 50.2	2.061
21	18 13 39.76	2.3075	27 54 42.3	2.203
22	18 15 58.10	2.3038	27 52 25.8	2.346
23	18 18 16.22	2.3002	27 50 0.8	2.487
24	18 20 34.12	2.2965	S.27 47 27.4	2.627

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 20 34.12	2.2965	S.27 47 27.4	2.627
1	18 22 51.80	2.2927	27 44 45.6	2.767
2	18 25 9.25	2.2888	27 41 55.4	2.907
3	18 27 26.46	2.2849	27 38 56.8	3.045
4	18 29 43.44	2.2810	27 35 50.0	3.182
5	18 32 0.18	2.2769	27 32 35.0	3.318
6	18 34 16.67	2.2728	27 29 11.8	3.455
7	18 36 32.91	2.2687	27 25 40.4	3.590
8	18 38 48.91	2.2646	27 22 1.0	3.724
9	18 41 4.66	2.2603	27 18 13.5	3.858
10	18 43 20.15	2.2559	27 14 18.0	3.992
11	18 45 35.37	2.2515	27 10 14.5	4.124
12	18 47 50.33	2.2471	27 6 3.1	4.256
13	18 50 5.02	2.2427	27 1 43.8	4.387
14	18 52 19.45	2.2382	26 57 16.7	4.516
15	18 54 33.61	2.2337	26 52 41.9	4.644
16	18 56 47.49	2.2291	26 47 59.4	4.772
17	18 59 1.10	2.2245	26 43 9.2	4.900
18	19 1 14.43	2.2198	26 38 11.4	5.027
19	19 3 27.48	2.2152	26 33 6.0	5.152
20	19 5 40.25	2.2104	26 27 53.2	5.276
21	19 7 52.73	2.2056	26 22 32.9	5.400
22	19 10 4.92	2.2008	26 17 5.2	5.523
23	19 12 16.83	2.1961	S.26 11 30.1	5.646

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 14 28.45	2.1912	S.26 5 47.7	5.767
1	19 16 39.78	2.1863	25 59 58.1	5.887
2	19 18 50.81	2.1814	25 54 1.3	6.007
3	19 21 1.55	2.1765	25 47 57.3	6.125
4	19 23 11.99	2.1715	25 41 46.3	6.242
5	19 25 22.13	2.1666	25 35 28.3	6.358
6	19 27 31.98	2.1617	25 29 3.3	6.475
7	19 29 41.53	2.1567	25 22 31.3	6.591
8	19 31 50.78	2.1517	25 15 52.4	6.705
9	19 33 59.73	2.1466	25 9 6.7	6.817
10	19 36 8.37	2.1415	25 2 14.3	6.929
11	19 38 16.71	2.1365	24 55 15.2	7.041
12	19 40 24.75	2.1314	24 48 9.4	7.152
13	19 42 32.48	2.1263	24 40 57.0	7.261
14	19 44 39.91	2.1213	24 33 38.1	7.368
15	19 46 47.04	2.1162	24 26 12.8	7.476
16	19 48 53.86	2.1112	24 18 41.0	7.583
17	19 51 0.38	2.1062	24 11 2.8	7.689
18	19 53 6.60	2.1011	24 3 18.3	7.793
19	19 55 12.51	2.0960	23 55 27.6	7.898
20	19 57 18.12	2.0909	23 47 30.6	8.002
21	19 59 23.42	2.0858	23 39 27.4	8.104
22	20 1 28.42	2.0808	23 31 18.1	8.205
23	20 3 33.12	2.0757	23 23 2.8	8.304
24	20 5 37.51	2.0707	S.23 14 41.6	8.403

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 5 37.51	2.0707	S. 23 14 41.6	8.403
1	20 7 41.60	2.0657	23 6 14.4	8.502
2	20 9 45.39	2.0607	22 57 41.3	8.600
3	20 11 48.88	2.0557	22 49 2.4	8.697
4	20 13 52.07	2.0507	22 40 17.7	8.792
5	20 15 54.96	2.0457	22 31 27.3	8.887
6	20 17 57.56	2.0408	22 22 31.3	8.980
7	20 19 59.86	2.0358	22 13 29.7	9.073
8	20 22 1.86	2.0309	22 4 22.5	9.166
9	20 24 3.57	2.0261	21 55 9.8	9.257
10	20 26 4.99	2.0212	21 45 51.7	9.347
11	20 28 6.11	2.0163	21 36 28.2	9.436
12	20 30 6.94	2.0114	21 26 59.4	9.524
13	20 32 7.48	2.0067	21 17 25.3	9.612
14	20 34 7.74	2.0019	21 7 46.0	9.698
15	20 36 7.71	1.9972	20 58 1.5	9.784
16	20 38 7.40	1.9925	20 48 11.9	9.869
17	20 40 6.81	1.9878	20 38 17.2	9.953
18	20 42 5.93	1.9831	20 28 17.5	10.037
19	20 44 4.78	1.9785	20 18 12.8	10.118
20	20 46 3.35	1.9739	20 8 3.3	10.199
21	20 48 1.65	1.9694	19 57 48.9	10.280
22	20 49 59.68	1.9648	19 47 29.7	10.359
23	20 51 57.43	1.9603	S. 19 37 5.8	10.437

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 53 54.91	1.9558	S. 19 26 37.2	10.515
1	20 55 52.13	1.9515	19 16 4.0	10.592
2	20 57 49.09	1.9471	19 5 26.2	10.668
3	20 59 45.78	1.9427	18 54 43.8	10.744
4	21 1 42.21	1.9384	18 43 56.9	10.818
5	21 3 38.39	1.9342	18 33 5.6	10.891
6	21 5 34.31	1.9299	18 22 10.0	10.963
7	21 7 29.98	1.9257	18 11 10.0	11.035
8	21 9 25.40	1.9216	18 0 5.8	11.106
9	21 11 20.57	1.9175	17 48 57.3	11.177
10	21 13 15.50	1.9135	17 37 44.6	11.245
11	21 15 10.19	1.9094	17 26 27.9	11.313
12	21 17 4.63	1.9054	17 15 7.1	11.381
13	21 18 58.84	1.9016	17 3 42.2	11.448
14	21 20 52.82	1.8977	16 52 13.4	11.513
15	21 22 46.57	1.8939	16 40 40.7	11.578
16	21 24 40.09	1.8901	16 29 4.1	11.643
17	21 26 33.38	1.8863	16 17 23.6	11.706
18	21 28 26.45	1.8827	16 5 39.4	11.768
19	21 30 19.30	1.8791	15 53 51.5	11.829
20	21 32 11.94	1.8755	15 41 59.9	11.890
21	21 34 4.36	1.8719	15 30 4.7	11.950
22	21 35 56.57	1.8684	15 18 5.9	12.009
23	21 37 48.57	1.8650	15 6 3.6	12.067
24	21 39 40.37	1.8617	S. 14 53 57.8	12.125

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 39 40.37	1.8617	S. 14 53 57.8	12.125
1	21 41 31.97	1.8583	14 41 48.6	12.182
2	21 43 23.37	1.8551	14 29 36.0	12.237
3	21 45 14.58	1.8519	14 17 20.1	12.292
4	21 47 5.59	1.8487	14 5 0.9	12.347
5	21 48 56.42	1.8456	13 52 38.5	12.401
6	21 50 47.06	1.8426	13 40 12.8	12.454
7	21 52 37.52	1.8395	13 27 44.0	12.505
8	21 54 27.80	1.8365	13 15 12.2	12.556
9	21 56 17.90	1.8336	13 2 37.3	12.607
10	21 58 7.83	1.8308	12 49 59.4	12.656
11	21 59 57.60	1.8281	12 37 18.6	12.704
12	22 1 47.20	1.8253	12 24 34.9	12.752
13	22 3 36.64	1.8227	12 11 48.4	12.799
14	22 5 25.92	1.8200	11 58 59.0	12.843
15	22 7 15.04	1.8174	11 46 6.8	12.888
16	22 9 4.01	1.8149	11 33 11.9	12.932
17	22 10 52.83	1.8125	11 20 14.4	12.976
18	22 12 41.51	1.8102	11 7 14.3	13.020
19	22 14 30.05	1.8078	10 54 11.6	13.065
20	22 16 18.45	1.8056	10 41 6.4	13.108
21	22 18 6.72	1.8034	10 27 58.7	13.149
22	22 19 54.86	1.8012	10 14 48.5	13.189
23	22 21 42.87	1.7991	S. 10 1 36.0	13.228

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 23 30.75	1.7971	S. 9 48 21.1	13.267
1	22 25 18.52	1.7952	9 35 3.9	13.305
2	22 27 6.17	1.7933	9 21 44.5	13.342
3	22 28 53.71	1.7914	9 8 22.9	13.378
4	22 30 41.14	1.7896	8 54 59.1	13.413
5	22 32 28.46	1.7878	8 41 33.3	13.446
6	22 34 15.68	1.7862	8 28 5.4	13.481
7	22 36 2.80	1.7846	8 14 35.5	13.515
8	22 37 49.83	1.7831	8 1 3.6	13.548
9	22 39 36.77	1.7816	7 47 29.7	13.581
10	22 41 23.62	1.7802	7 33 53.9	13.611
11	22 43 10.39	1.7788	7 20 16.4	13.640
12	22 44 57.08	1.7775	7 6 37.1	13.670
13	22 46 43.69	1.7763	6 52 56.0	13.699
14	22 48 30.23	1.7752	6 39 13.2	13.727
15	22 50 16.71	1.7741	6 25 28.8	13.753
16	22 52 3.12	1.7730	6 11 42.8	13.780
17	22 53 49.47	1.7720	5 57 55.2	13.806
18	22 55 35.76	1.7711	5 44 6.1	13.831
19	22 57 22.00	1.7703	5 30 15.5	13.855
20	22 59 8.19	1.7695	5 16 23.5	13.878
21	23 0 54.34	1.7688	5 2 30.1	13.901
22	23 2 40.44	1.7681	4 48 35.4	13.922
23	23 4 26.51	1.7675	4 34 39.4	13.943
24	23 6 12.54	1.7669	S. 4 20 42.2	13.963

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 6 12.54	1.7669	S. 4 20 42.2	13.963
1	23 7 58.54	1.7665	4 6 43.8	13.983
2	23 9 44.52	1.7661	3 52 44.2	14.002
3	23 11 30.47	1.7657	3 38 43.6	14.019
4	23 13 16.40	1.7654	3 24 41.9	14.037
5	23 15 2.32	1.7653	3 10 39.2	14.053
6	23 16 48.24	1.7652	2 56 35.5	14.069
7	23 18 34.15	1.7651	2 42 30.9	14.084
8	23 20 20.05	1.7650	2 28 25.4	14.098
9	23 22 5.95	1.7651	2 14 19.1	14.111
10	23 23 51.86	1.7652	2 0 12.1	14.124
11	23 25 37.78	1.7654	1 46 4.3	14.136
12	23 27 23.71	1.7657	1 31 55.8	14.147
13	23 29 9.66	1.7660	1 17 46.7	14.157
14	23 30 55.63	1.7663	1 3 37.0	14.166
15	23 32 41.62	1.7667	0 49 26.8	14.174
16	23 34 27.64	1.7672	0 35 16.1	14.182
17	23 36 13.69	1.7678	0 21 4.9	14.190
18	23 37 59.78	1.7685	S. 0 6 53.3	14.197
19	23 39 45.91	1.7692	N. 0 7 18.7	14.202
20	23 41 32.09	1.7700	0 21 30.9	14.205
21	23 43 18.31	1.7708	0 35 43.3	14.208
22	23 45 4.59	1.7718	0 49 55.9	14.212
23	23 46 50.93	1.7727	N. 1 4 8.7	14.215

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	23 48 37.32	1.7737	N. 1 18 21.7	14.217
1	23 50 23.77	1.7748	1 32 34.7	14.217
2	23 52 10.30	1.7761	1 46 47.7	14.217
3	23 53 56.90	1.7774	2 1 0.7	14.216
4	23 55 43.58	1.7787	2 15 13.6	14.213
5	23 57 30.34	1.7800	2 29 26.3	14.211
6	23 59 17.18	1.7814	2 43 38.9	14.208
7	0 1 4.11	1.7830	2 57 51.3	14.203
8	0 2 51.14	1.7846	3 12 3.3	14.198
9	0 4 38.26	1.7862	3 26 15.0	14.192
10	0 6 25.48	1.7879	3 40 26.3	14.185
11	0 8 12.81	1.7897	3 54 37.2	14.177
12	0 10 0.24	1.7915	4 8 47.6	14.169
13	0 11 47.79	1.7935	4 22 57.5	14.159
14	0 13 35.46	1.7954	4 37 6.7	14.148
15	0 15 23.24	1.7974	4 51 15.3	14.137
16	0 17 11.15	1.7996	5 5 23.2	14.126
17	0 18 59.19	1.8018	5 19 30.4	14.113
18	0 20 47.37	1.8041	5 33 36.8	14.100
19	0 22 35.68	1.8063	5 47 42.4	14.085
20	0 24 24.13	1.8087	6 1 47.0	14.069
21	0 26 12.73	1.8112	6 15 50.7	14.053
22	0 28 1.48	1.8137	6 29 53.4	14.036
23	0 29 50.38	1.8163	6 43 55.0	14.017
24	0 31 39.44	1.8190	N. 6 57 55.4	13.998

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 31 39.44	1.8190	N. 6 57 55.4	13.998
1	0 33 28.66	1.8217	7 11 54.7	13.978
2	0 35 18.05	1.8245	7 25 52.8	13.958
3	0 37 7.60	1.8273	7 39 49.6	13.936
4	0 38 57.33	1.8303	7 53 45.1	13.912
5	0 40 47.24	1.8333	8 7 39.1	13.888
6	0 42 37.33	1.8363	8 21 31.7	13.864
7	0 44 27.60	1.8394	8 35 22.8	13.838
8	0 46 18.06	1.8427	8 49 12.3	13.812
9	0 48 8.72	1.8460	9 3 0.3	13.786
10	0 49 59.58	1.8493	9 16 46.6	13.757
11	0 51 50.64	1.8527	9 30 31.1	13.727
12	0 53 41.90	1.8561	9 44 13.9	13.697
13	0 55 33.37	1.8597	9 57 54.8	13.666
14	0 57 25.06	1.8632	10 11 33.8	13.634
15	0 59 16.96	1.8668	10 25 10.9	13.601
16	1 1 9.08	1.8706	10 38 45.9	13.566
17	1 3 1.43	1.8745	10 52 18.8	13.531
18	1 4 54.02	1.8784	11 5 49.6	13.495
19	1 6 46.84	1.8823	11 19 18.2	13.457
20	1 8 39.89	1.8862	11 32 44.5	13.419
21	1 10 33.18	1.8903	11 46 8.5	13.380
22	1 12 26.72	1.8944	11 59 30.1	13.340
23	1 14 20.51	1.8985	N.12 12 49.3	13.299

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 16 14.54	1.9027	N.12 26 6.0	13.257
1	1 18 8.83	1.9071	12 39 20.1	13.213
2	1 20 3.39	1.9115	12 52 31.6	13.169
3	1 21 58.21	1.9159	13 5 40.4	13.123
4	1 23 53.30	1.9204	13 18 46.4	13.077
5	1 25 48.66	1.9250	13 31 49.6	13.029
6	1 27 44.30	1.9297	13 44 49.9	12.981
7	1 29 40.22	1.9343	13 57 47.3	12.931
8	1 31 36.42	1.9390	14 10 41.6	12.880
9	1 33 32.90	1.9438	14 23 32.9	12.828
10	1 35 29.67	1.9487	14 36 21.0	12.775
11	1 37 26.74	1.9536	14 49 5.9	12.721
12	1 39 24.10	1.9585	15 1 47.5	12.666
13	1 41 21.76	1.9636	15 14 25.8	12.609
14	1 43 19.73	1.9687	15 27 0.6	12.552
15	1 45 18.01	1.9738	15 39 32.0	12.494
16	1 47 16.59	1.9790	15 51 59.9	12.434
17	1 49 15.49	1.9843	16 4 24.1	12.373
18	1 51 14.71	1.9897	16 16 44.6	12.311
19	1 53 14.25	1.9950	16 29 1.4	12.247
20	1 55 14.11	2.0004	16 41 14.3	12.183
21	1 57 14.30	2.0059	16 53 23.4	12.118
22	1 59 14.82	2.0114	17 5 28.5	12.051
23	2 1 15.67	2.0170	17 17 29.5	11.983
24	2 3 16.86	2.0227	N.17 29 26.4	11.914

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 25.					**THURSDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 3 16.86	2.0227	N.17 29 26.4	11.914	0	3 47 31.34	2.3270	N.25 17 53.9	7.106
1	2 5 18.39	2.0283	17 41 19.2	11.844	1	3 49 51.15	2.3333	25 24 56.3	6.973
2	2 7 20.26	2.0340	17 53 7.7	11.773	2	3 52 11.33	2.3395	25 31 50.7	6.840
3	2 9 22.47	2.0398	18 4 51.9	11.700	3	3 54 31.89	2.3457	25 38 37.1	6.705
4	2 11 25.03	2.0457	18 16 31.7	11.626	4	3 56 52.82	2.3520	25 45 15.3	6.569
5	2 13 27.95	2.0516	18 28 7.0	11.551	5	3 59 14.13	2.3582	25 51 45.4	6.432
6	2 15 31.22	2.0574	18 39 37.8	11.475	6	4 1 35.81	2.3643	25 58 7.2	6.294
7	2 17 34.84	2.0633	18 51 4.0	11.397	7	4 3 57.85	2.3704	26 4 20.7	6.154
8	2 19 38.82	2.0694	19 2 25.5	11.318	8	4 6 20.26	2.3765	26 10 25.7	6.013
9	2 21 43.17	2.0755	19 13 42.2	11.238	9	4 8 43.03	2.3824	26 16 22.2	5.871
10	2 23 47.88	2.0815	19 24 54.0	11.157	10	4 11 6.15	2.3883	26 22 10.2	5.728
11	2 25 52.95	2.0876	19 36 1.0	11.075	11	4 13 29.62	2.3942	26 27 49.5	5.583
12	2 27 58.39	2.0937	19 47 3.0	10.991	12	4 15 53.45	2.4000	26 33 20.1	5.437
13	2 30 4.20	2.0999	19 57 59.9	10.906	13	4 18 17.62	2.4057	26 38 41.9	5.290
14	2 32 10.38	2.1062	20 8 51.7	10.819	14	4 20 42.13	2.4114	26 43 54.9	5.141
15	2 34 16.94	2.1125	20 19 38.2	10.731	15	4 23 6.99	2.4171	26 48 58.9	4.992
16	2 36 23.88	2.1187	20 30 19.4	10.642	16	4 25 32.18	2.4225	26 53 53.9	4.842
17	2 38 31.19	2.1250	20 40 55.3	10.552	17	4 27 57.69	2.4279	26 58 39.9	4.691
18	2 40 38.88	2.1314	20 51 25.7	10.461	18	4 30 23.53	2.4333	27 3 16.8	4.538
19	2 42 46.96	2.1378	21 1 50.6	10.368	19	4 32 49.69	2.4386	27 7 44.5	4.384
20	2 44 55.42	2.1442	21 12 9.9	10.274	20	4 35 16.16	2.4438	27 12 2.9	4.229
21	2 47 4.26	2.1506	21 22 23.5	10.178	21	4 37 42.95	2.4490	27 16 12.0	4.073
22	2 49 13.49	2.1571	21 32 31.3	10.082	22	4 40 10.04	2.4540	27 20 11.7	3.916
23	2 51 23.11	2.1636	N.21 42 33.3	9.984	23	4 42 37.43	2.4590	N.27 24 1.9	3.757
	WEDNESDAY 26.					**FRIDAY 28.**			
0	2 53 33.12	2.1701	N.21 52 29.4	9.885	0	4 45 5.12	2.4638	N.27 27 42.6	3.596
1	2 55 43.52	2.1766	22 2 19.5	9.784	1	4 47 33.09	2.4686	27 31 13.7	3.436
2	2 57 54.31	2.1831	22 12 3.5	9.682	2	4 50 1.35	2.4733	27 34 35.2	3.278
3	3 0 5.49	2.1897	22 21 41.4	9.579	3	4 52 29.89	2.4779	27 37 47.0	3.116
4	3 2 17.07	2.1962	22 31 13.0	9.474	4	4 54 58.70	2.4823	27 40 49.1	2.952
5	3 4 29.04	2.2027	22 40 38.3	9.368	5	4 57 27.77	2.4867	27 43 41.3	2.788
6	3 6 41.40	2.2093	22 49 57.2	9.262	6	4 59 57.10	2.4910	27 46 23.7	2.624
7	3 8 54.16	2.2159	22 59 9.7	9.153	7	5 2 26.69	2.4952	27 48 56.2	2.458
8	3 11 7.31	2.2225	23 8 15.6	9.042	8	5 4 56.52	2.4992	27 51 18.7	2.292
9	3 13 20.86	2.2292	23 17 14.8	8.931	9	5 7 26.59	2.5031	27 53 31.2	2.124
10	3 15 34.81	2.2358	23 26 7.3	8.819	10	5 9 56.89	2.5069	27 55 33.6	1.956
11	3 17 49.15	2.2423	23 34 53.1	8.706	11	5 12 27.42	2.5107	27 57 25.9	1.787
12	3 20 3.89	2.2489	23 43 32.0	8.590	12	5 14 58.17	2.5143	27 59 8.1	1.618
13	3 22 19.02	2.2555	23 52 3.9	8.473	13	5 17 29.13	2.5178	28 0 40.1	1.447
14	3 24 34.55	2.2621	24 0 28.8	8.356	14	5 20 0.30	2.5211	28 2 1.8	1.276
15	3 26 50.47	2.2686	24 8 46.6	8.237	15	5 22 31.66	2.5243	28 3 13.2	1.104
16	3 29 6.78	2.2752	24 16 57.2	8.117	16	5 25 3.21	2.5274	28 4 14.3	0.932
17	3 31 23.49	2.2817	24 25 0.6	7.996	17	5 27 34.95	2.5306	28 5 5.0	0.758
18	3 33 40.59	2.2882	24 32 56.6	7.872	18	5 30 6.87	2.5334	28 5 45.3	0.585
19	3 35 58.08	2.2947	24 40 45.2	7.747	19	5 32 38.96	2.5362	28 6 15.2	0.411
20	3 38 15.96	2.3012	24 48 26.3	7.621	20	5 35 11.21	2.5387	28 6 34.6	0.236
21	3 40 34.22	2.3076	24 55 59.7	7.494	21	5 37 43.60	2.5411	28 6 43.5	+0.060
22	3 42 52.87	2.3141	25 3 25.5	7.366	22	5 40 16.14	2.5435	28 6 41.8	−0.116
23	3 45 11.91	2.3206	25 10 43.6	7.237	23	5 42 48.82	2.5457	28 6 29.6	0.292
24	3 47 31.34	2.3270	N.25 17 53.9	7.106	24	5 45 21.63	2.5478	N.28 6 6.8	0.469

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 29.					SUNDAY 30.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 45 21.63	2.5478	N.28 6 6.8	0.469	0	6 46 47.25	2.5583	N.27 3 19.9	4.768
1	5 47 54.56	2.5498	28 5 33.3	0.646	1	6 49 20.72	2.5572	26 58 28.5	4.946
2	5 50 27.61	2.5517	28 4 49.2	0.823	2	6 51 54.11	2.5558	26 53 26.4	5.123
3	5 53 0.76	2.5533	28 3 54.5	1.001	3	6 54 27.42	2.5544	26 48 13.7	5.301
4	5 55 34.01	2.5549	28 2 49.1	1.180	4	6 57 0.64	2.5529	26 42 50.3	5.478
5	5 58 7.35	2.5563	28 1 32.9	1.359	5	6 59 33.77	2.5513	26 37 16.3	5.654
6	6 0 40.77	2.5577	28 0 6.0	1.538	6	7 2 6.80	2.5496	26 31 31.8	5.830
7	6 3 14.27	2.5588	27 58 28.4	1.717	7	7 4 39.72	2.5477	26 25 36.7	6.006
8	6 5 47.83	2.5598	27 56 40.0	1.896	8	7 7 12.52	2.5457	26 19 31.1	6.181
9	6 8 21.45	2.5607	27 54 40.9	2.075	9	7 9 45.20	2.5436	26 13 15.0	6.355
10	6 10 55.12	2.5615	27 52 31.0	2.255	10	7 12 17.75	2.5414	26 6 48.5	6.528
11	6 13 28.83	2.5621	27 50 10.3	2.435	11	7 14 50.17	2.5392	26 0 11.6	6.702
12	6 16 2.57	2.5626	27 47 38.8	2.615	12	7 17 22.45	2.5368	25 53 24.3	6.874
13	6 18 36.34	2.5630	27 44 56.5	2.795	13	7 19 54.58	2.5343	25 46 26.7	7.046
14	6 21 10.13	2.5632	27 42 3.4	2.974	14	7 22 26.56	2.5317	25 39 18.8	7.217
15	6 23 43.93	2.5633	27 38 59.6	3.154	15	7 24 58.38	2.5290	25 32 0.7	7.387
16	6 26 17.73	2.5632	27 35 44.9	3.335	16	7 27 30.04	2.5262	25 24 32.4	7.557
17	6 28 51.52	2.5631	27 32 19.4	3.514	17	7 30 1.52	2.5233	25 16 53.9	7.726
18	6 31 25.30	2.5628	27 28 43.2	3.693	18	7 32 32.83	2.5203	25 9 5.3	7.894
19	6 33 59.06	2.5624	27 24 56.2	3.873	19	7 35 3.96	2.5173	25 1 6.6	8.061
20	6 36 32.79	2.5618	27 20 58.4	4.052	20	7 37 34.91	2.5142	24 52 58.0	8.227
21	6 39 6.48	2.5612	27 16 49.9	4.232	21	7 40 5.67	2.5111	24 44 39.4	8.392
22	6 41 40.13	2.5603	27 12 30.6	4.411	22	7 42 36.24	2.5078	24 36 10.9	8.557
23	6 44 13.72	2.5593	27 8 0.6	4.589	23	7 45 6.61	2.5044	24 27 32.6	8.720
24	6 46 47.25	2.5583	N.27 3 19.9	4.768	24	7 47 36.77	2.5010	N.24 18 44.5	8.882

PHASES OF THE MOON.

	d	h	m
● New Moon, ...	7	1	0.4
☽ First Quarter, ...	13	23	8.0
○ Full Moon, ...	22	3	34.6
☾ Last Quarter, ...	29	18	20.6

	d	h
☾ Perigee, ...	6	8.9
☾ Apogee, ...	19	1.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
1	Mars	W.	92° 37′ 41″	2435	94° 20′ 26″	2419	96° 3′ 34″	2403	97° 47′ 5″	2386
	Saturn	W.	89 24 22	2467	91 6 22	2451	92 48 44	2434	94 31 30	2418
	α Pegasi	W.	83 35 9	2690	85 12 2	2672	86 49 19	2655	88 26 59	2639
	α Arietis	W.	40 43 35	2523	42 24 16	2504	44 5 24	2485	45 46 58	2467
	Pollux	E.	34 35 50	2505	32 54 44	2491	31 13 18	2477	29 31 32	2463
	Sun	E.	82 21 36	2803	80 47 12	2785	79 12 25	2768	77 37 15	2750
2	α Arietis	W.	54 21 18	2376	56 5 27	2358	57 50 2	2341	59 35 2	2324
	Aldebaran	W.	24 36 32	2804	26 10 55	2734	27 46 50	2674	29 24 5	2620
	Sun	E.	69 35 32	2661	67 58 0	2643	66 20 4	2626	64 41 44	2609
3	α Arietis	W.	68 26 12	2241	70 13 38	2226	72 1 27	2210	73 49 39	2195
	Aldebaran	W.	37 46 18	2423	39 29 20	2394	41 13 4	2366	42 57 29	2339
	Sun	E.	56 24 11	2524	54 43 31	2507	53 2 28	2492	51 21 3	2476
4	Aldebaran	W.	51 48 15	2231	53 35 56	2213	55 24 4	2196	57 12 37	2181
	Sun	E.	42 48 41	2405	41 5 13	2392	39 21 27	2380	37 37 23	2368
9	Sun	W.	27 32 18	2450	29 14 42	2465	30 56 44	2481	32 38 24	2497
	Antares	E.	53 43 28	2148	51 53 42	2163	50 4 18	2178	48 15 17	2194
	Jupiter	E.	70 14 49	2184	68 25 57	2200	66 37 29	2216	64 49 25	2232
10	Sun	W.	41 0 46	2587	42 39 59	2605	44 18 47	2624	45 57 9	2644
	Antares	E.	39 16 17	2277	37 29 44	2296	35 43 38	2313	33 57 58	2332
	Jupiter	E.	55 55 21	2321	54 9 52	2339	52 24 50	2359	50 40 16	2378
	α Aquilæ	E.	93 23 0	2993	91 52 38	3009	90 22 36	3026	88 52 56	3045
11	Sun	W.	54 2 20	2744	55 38 2	2763	57 13 18	2784	58 48 7	2804
	Venus	W.	21 0 19	2909	22 32 27	2919	24 4 22	2931	25 36 2	2943
	Spica	W.	20 44 5	2443	22 26 38	2460	24 8 48	2477	25 50 34	2493
	Jupiter	E.	42 4 37	2482	40 22 58	2503	38 41 49	2525	37 1 11	2548
	α Aquilæ	E.	81 30 55	3159	80 3 57	3186	78 37 31	3213	77 11 37	3242
12	Sun	W.	66 35 41	2904	68 7 55	2924	69 39 43	2943	71 11 7	2962
	Spica	W.	34 13 26	2580	35 52 48	2599	37 31 45	2615	39 10 19	2633
	Venus	W.	33 9 45	3024	34 39 28	3042	36 8 49	3059	37 37 49	3077
	Jupiter	E.	28 46 0	2669	27 8 39	2696	25 31 54	2725	23 55 47	2756
	α Aquilæ	E.	70 11 11	3408	68 49 3	3445	67 27 37	3483	66 6 54	3524
13	Sun	W.	78 42 10	3056	80 11 14	3073	81 39 57	3091	83 8 18	3108
	Spica	W.	47 17 20	2717	48 53 37	2733	50 29 33	2749	52 5 8	2764
	Venus	W.	44 57 27	3163	46 24 20	3181	47 50 52	3197	49 17 5	3214
	α Aquilæ	E.	59 35 5	3755	58 19 16	3809	57 4 23	3864	55 50 27	3924
	Mars	E.	91 30 34	2661	89 53 2	2678	88 15 52	2694	86 39 4	2709
	Saturn	E.	96 59 22	2695	95 22 36	2711	93 46 11	2727	92 10 7	2743
14	Sun	W.	90 25 2	3188	91 51 26	3203	93 17 32	3217	94 43 21	3231
	Spica	W.	59 58 6	2637	61 31 46	2651	63 5 8	2664	64 38 13	2676
	Venus	W.	56 23 23	3291	57 47 45	3306	59 11 49	3320	60 35 37	3334
	Antares	W.	14 3 39	2638	15 37 17	2651	17 10 39	2664	18 43 44	2676
	α Aquilæ	E.	49 56 46	4279	48 49 34	4364	47 43 40	4456	46 39 9	4554
	Fomalhaut	E.	69 34 17	3184	68 7 49	3205	66 41 46	3226	65 16 8	3249
	Mars	E.	78 40 5	2783	77 5 15	2797	75 30 43	2811	73 56 29	2824

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Mars	W.	99° 31′ 0″	2371	101° 15′ 17″	2354	102° 59′ 58″	2338	104° 45′ 2″	2322
	Saturn	W.	96 14 39	2401	97 58 12	2385	99 42 8	2368	101 26 28	2352
	α Pegasi	W.	90 5 1	2622	91 43 26	2606	93 22 13	2590	95 1 22	2574
	α Arietis	W.	47 28 58	2448	49 11 24	2430	50 54 16	2412	52 37 34	2394
	Pollux	E.	27 49 27	2450	26 7 4	2438	24 24 24	2428	22 41 29	2417
	Sun	E.	76 1 42	2732	74 25 45	2714	72 49 24	2697	71 12 40	2679
2	α Arietis	W.	61 20 27	2307	63 6 17	2290	64 52 31	2273	66 39 10	2256
	Aldebaran	W.	31 2 33	2572	32 42 6	2530	34 22 37	2491	36 4 3	2456
	Sun	E.	63 3 1	2591	61 23 54	2574	59 44 23	2557	58 4 29	2540
3	α Arietis	W.	75 38 14	2181	77 27 10	2167	79 16 28	2153	81 6 6	2139
	Aldebaran	W.	44 42 31	2315	46 28 9	2292	48 14 20	2270	50 1 3	2251
	Sun	E.	49 39 16	2461	47 57 8	2446	46 14 39	2432	44 31 50	2418
4	Aldebaran	W.	59 1 33	2167	60 50 51	2153	62 40 30	2140	64 30 28	2128
	Sun	E.	35 53 3	2357	34 8 27	2346	32 23 35	2337	30 38 29	2328
9	Sun	W.	34 19 41	2515	36 0 34	2532	37 41 3	2550	39 21 7	2568
	Antares	E.	46 26 40	2910	44 38 27	2926	42 50 38	2943	41 3 15	2960
	Jupiter	E.	63 1 45	2949	61 14 30	2966	59 27 41	2984	57 41 18	3002
10	Sun	W.	47 35 4	2663	49 12 33	2684	50 49 35	2703	52 26 11	2723
	Antares	E.	32 12 45	2350	30 27 58	2368	28 43 38	2387	26 59 45	2406
	Jupiter	E.	48 56 10	2398	47 12 33	2419	45 29 25	2439	43 46 46	2460
	α Aquilæ	E.	87 23 39	3065	85 54 47	3087	84 26 22	3110	82 58 24	3133
11	Sun	W.	60 22 30	2824	61 56 27	2845	63 29 57	2864	65 3 2	2884
	Venus	W.	27 7 26	2958	28 38 31	2974	30 9 16	2990	31 39 41	3007
	Spica	W.	27 31 57	2510	29 12 56	2528	30 53 30	2545	32 33 40	2563
	Jupiter	E.	35 21 4	2571	33 41 29	2594	32 2 26	2618	30 23 56	2643
	α Aquilæ	E.	75 46 18	3273	74 21 35	3304	72 57 28	3338	71 34 0	3372
12	Sun	W.	72 42 7	2981	74 12 43	3001	75 42 55	3019	77 12 44	3038
	Spica	W.	40 48 29	2650	42 26 16	2667	44 3 40	2684	45 40 41	2701
	Venus	W.	39 6 27	3094	40 34 44	3119	42 2 39	3132	43 30 13	3146
	Jupiter	E.	22 20 21	2669	20 45 39	2696	19 11 45	2722	17 38 46	2750
	α Aquilæ	E.	64 46 56	3565	63 27 44	3610	62 9 21	3656	60 51 47	3705
13	Sun	W.	84 36 18	3124	86 3 58	3140	87 31 19	3157	88 58 20	3173
	Spica	W.	53 40 23	2779	55 15 18	2795	56 49 53	2809	58 24 9	2824
	Venus	W.	50 42 58	3230	52 8 32	3246	53 33 47	3261	54 58 44	3276
	α Aquilæ	E.	54 37 32	3966	53 25 39	4053	52 14 52	4124	51 5 13	4199
	Mars	E.	85 2 36	2724	83 26 28	2740	81 50 41	2754	80 15 13	2769
	Saturn	E.	90 34 24	2759	88 59 2	2773	87 23 59	2788	85 49 15	2802
14	Sun	W.	96 8 54	3244	97 34 11	3258	98 59 12	3270	100 23 58	3282
	Spica	W.	66 11 2	2889	67 43 35	2901	69 15 53	2912	70 47 56	2924
	Venus	W.	61 59 9	3347	63 22 26	3360	64 45 28	3372	66 8 16	3385
	Antares	W.	20 16 34	2888	21 49 8	2899	23 21 28	2911	24 53 33	2923
	α Aquilæ	E.	45 36 4	4660	44 34 31	4775	43 34 34	4900	42 36 19	5035
	Fomalhaut	E.	63 50 57	3271	62 26 12	3294	61 1 54	3318	59 38 3	3343
	Mars	E.	72 22 32	2836	70 48 51	2849	69 15 27	2862	67 42 19	2873

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Saturn	E.	84° 14′ 50″	2616	82° 40′ 43″	2629	81° 6′ 53″	2643	79° 33′ 21″	2655
15	Sun	W.	101 48 30	3294	103 12 48	3306	104 36 52	3317	106 0 44	3327
	Spica	W.	72 19 45	2935	73 51 20	2945	75 22 42	2955	76 53 51	2964
	Venus	W.	67 30 49	3397	68 53 9	3408	70 15 17	3419	71 37 12	3430
	Antares	W.	26 25 23	2933	27 57 6	2943	29 28 24	2954	30 59 35	2963
	Fomalhaut	E.	58 14 41	3367	56 51 47	3393	55 29 23	3420	54 7 29	3448
	Mars	E.	66 9 26	2885	64 36 48	2896	63 4 24	2907	61 32 14	2918
	Saturn	E.	71 49 37	2914	70 17 36	2925	68 45 49	2935	67 14 15	2944
	α Pegasi	E.	79 29 49	3146	78 2 35	3158	76 35 36	3172	75 8 53	3184
16	Sun	W.	112 57 12	3373	114 19 59	3381	115 42 37	3389	117 5 6	3396
	Venus	W.	78 24 1	3475	79 44 53	3482	81 5 37	3489	82 26 13	3497
	Antares	W.	38 32 45	3004	40 2 53	3011	41 32 52	3018	43 2 43	3023
	Jupiter	W.	22 7 2	3141	23 34 22	3136	25 1 48	3133	26 29 18	3131
	Fomalhaut	E.	47 26 19	3610	46 7 56	3649	44 50 14	3690	43 33 16	3734
	Mars	E.	53 54 39	2966	52 23 44	2975	50 53 0	2984	49 22 27	2992
	Saturn	E.	59 39 16	2988	58 8 48	2995	56 38 29	3002	55 8 19	3009
	α Pegasi	E.	67 59 3	3947	66 33 49	3960	65 8 51	3973	63 44 8	3986
17	Sun	W.	123 55 42	3424	125 17 31	3430	126 39 14	3433	128 0 53	3437
	Venus	W.	89 7 26	3525	90 27 23	3529	91 47 15	3533	93 7 3	3537
	Antares	W.	50 30 13	3049	51 59 25	3053	53 28 32	3056	54 57 35	3060
	Jupiter	W.	33 47 7	3129	35 14 41	3130	36 42 14	3131	38 9 46	3131
	Mars	E.	41 52 14	3032	40 22 41	3039	38 53 17	3047	37 24 3	3056
	Saturn	E.	47 39 23	3037	46 9 56	3042	44 40 35	3047	43 11 20	3051
	α Pegasi	E.	56 44 25	3355	55 21 17	3371	53 58 27	3386	52 35 54	3402
	α Arietis	E.	97 41 30	3067	96 12 40	3071	94 43 55	3074	93 15 14	3077
18	Antares	W.	62 22 0	3070	63 50 46	3072	65 19 30	3072	66 48 14	3073
	Jupiter	W.	45 27 21	3133	46 54 51	3132	48 22 22	3132	49 49 53	3132
	Mars	E.	30 0 30	3102	28 32 23	3114	27 4 31	3128	25 36 55	3143
	Saturn	E.	35 46 15	3068	34 17 26	3072	32 48 42	3075	31 20 2	3078
	α Pegasi	E.	45 48 14	3502	44 27 52	3526	43 7 57	3553	41 48 31	3582
	α Arietis	E.	85 52 36	3088	84 24 12	3089	82 55 49	3091	81 27 28	3091
19	Antares	W.	74 11 51	3071	75 40 36	3069	77 9 23	3068	78 38 12	3066
	Jupiter	W.	57 7 42	3125	58 35 21	3124	60 3 2	3122	61 30 45	3119
	α Arietis	E.	74 5 45	3090	72 37 23	3089	71 9 0	3088	69 40 36	3087
20	Jupiter	W.	68 50 7	3105	70 18 10	3102	71 46 17	3099	73 14 28	3096
	α Aquilæ	W.	43 33 6	4936	44 30 52	4832	45 30 2	4738	46 30 30	4651
	α Arietis	E.	62 18 6	3077	60 49 28	3075	59 20 48	3073	57 52 5	3069
	Aldebaran	E.	94 0 55	3130	92 33 22	3127	91 5 45	3124	89 38 4	3119
21	Jupiter	W.	80 36 34	3074	82 5 15	3070	83 34 1	3065	85 2 53	3060
	α Aquilæ	W.	51 49 43	4306	52 56 30	4252	54 4 7	4201	55 12 32	4153
	α Arietis	E.	50 27 37	3056	48 58 33	3052	47 29 25	3049	46 0 13	3047
	Aldebaran	E.	82 18 32	3101	80 50 24	3098	79 22 12	3094	77 53 55	3090
22	Jupiter	W.	92 28 43	3035	93 58 12	3030	95 27 48	3024	96 57 31	3018
	α Aquilæ	W.	61 5 12	3956	62 17 35	3924	63 30 30	3894	64 43 56	3865
	α Arietis	E.	38 33 22	3033	37 3 50	3031	35 34 16	3030	34 4 40	3029

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Saturn	E.	78° 0′ 5″	2868	76° 27′ 5″	2880	74° 54′ 21″	2892	73° 21′ 52″	2903
15	Sun	W.	107 24 24	3338	108 47 52	3347	110 11 9	3356	111 34 16	3365
	Spica	W.	78 24 49	2973	79 55 35	2982	81 26 10	2991	82 56 34	2998
	Venus	W.	72 58 55	3439	74 20 27	3449	75 41 48	3458	77 2 59	3466
	Antares	W.	32 30 35	2972	34 1 23	2980	35 32 1	2989	37 2 28	2997
	Fomalhaut	E.	52 46 7	3478	51 25 18	3507	50 5 2	3540	48 45 22	3574
	Mars	E.	60 0 18	2928	58 28 35	2938	56 57 4	2948	55 25 46	2957
	Saturn	E.	65 42 52	2954	64 11 41	2963	62 40 42	2972	61 9 54	2980
	α Pegasi	E.	73 42 25	3197	72 16 12	3209	70 50 14	3222	69 24 31	3235
16	Sun	W.	118 27 27	3402	119 49 41	3408	121 11 48	3415	122 33 48	3422
	Venus	W.	83 46 41	3503	85 7 2	3509	86 27 16	3515	87 47 24	3520
	Antares	W.	44 32 27	3030	46 2 3	3034	47 31 33	3040	49 0 56	3045
	Jupiter	W.	27 56 50	3129	29 24 24	3129	30 51 58	3129	32 19 33	3129
	Fomalhaut	E.	42 17 5	3782	41 1 44	3835	39 47 18	3892	38 33 50	3954
	Mars	E.	47 52 4	3000	46 21 51	3009	44 51 49	3017	43 21 57	3024
	Saturn	E.	53 38 17	3015	52 8 23	3021	50 38 36	3026	49 8 56	3032
	α Pegasi	E.	62 19 40	3300	60 55 28	3313	59 31 31	3326	58 7 50	3340
17	Sun	W.	129 22 28	3440	130 43 59	3444	132 5 26	3446	133 26 50	3448
	Venus	W.	94 26 46	3540	95 46 26	3542	97 6 4	3545	98 25 39	3547
	Antares	W.	56 26 34	3063	57 55 29	3065	59 24 22	3067	60 53 12	3069
	Jupiter	W.	39 37 18	3132	41 4 49	3132	42 32 20	3132	43 59 51	3133
	Mars	E.	35 54 59	3064	34 26 5	3073	32 57 22	3082	31 28 50	3091
	Saturn	E.	41 42 10	3055	40 13 5	3058	38 44 4	3062	37 15 8	3065
	α Pegasi	E.	51 13 40	3420	49 51 46	3438	48 30 13	3458	47 9 2	3479
	α Arietis	E.	91 46 36	3080	90 18 2	3082	88 49 31	3084	87 21 2	3087
18	Antares	W.	68 16 57	3073	69 45 40	3073	71 14 23	3072	72 43 7	3072
	Jupiter	W.	51 17 24	3131	52 44 56	3129	54 12 30	3129	55 40 5	3127
	Mars	E.	24 9 38	3162	22 42 43	3183	21 16 13	3209	19 50 14	3241
	Saturn	E.	29 51 25	3081	28 22 52	3084	26 54 23	3088	25 25 59	3093
	α Pegasi	E.	40 29 37	3614	39 11 18	3649	37 53 37	3689	36 36 38	3733
	α Arietis	E.	79 59 7	3091	78 30 46	3091	77 2 26	3091	75 34 6	3091
19	Antares	W.	80 7 3	3065	81 35 56	3062	83 4 52	3060	84 33 51	3056
	Jupiter	W.	62 58 31	3117	64 26 20	3114	65 54 12	3111	67 22 8	3109
	α Arietis	E.	68 12 10	3086	66 43 43	3083	65 15 13	3082	63 46 41	3079
20	Jupiter	W.	74 42 43	3091	76 11 3	3087	77 39 28	3083	79 7 58	3078
	α Aquilæ	W.	47 32 11	4571	48 35 1	4498	49 38 55	4429	50 43 50	4365
	α Arietis	E.	56 23 18	3067	54 54 28	3065	53 25 35	3061	51 56 38	3058
	Aldebaran	E.	88 10 18	3116	86 42 28	3113	85 14 34	3109	83 46 35	3105
21	Jupiter	W.	86 31 51	3056	88 0 54	3051	89 30 4	3046	90 59 20	3040
	α Aquilæ	W.	56 21 43	4108	57 31 37	4067	58 42 11	4028	59 53 23	3990
	α Arietis	E.	44 30 58	3043	43 1 39	3041	41 32 17	3038	40 2 51	3035
	Aldebaran	E.	76 25 33	3086	74 57 6	3082	73 28 35	3078	71 59 59	3074
22	Jupiter	W.	98 27 21	3013	99 57 18	3007	101 27 22	3001	102 57 33	2995
	α Aquilæ	W.	65 57 51	3838	67 12 14	3813	68 27 3	3789	69 42 17	3766
	α Arietis	E.	32 35 3	3026	31 5 25	3028	29 35 47	3029	28 6 10	3031

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Aldebaran	E.	70° 31′ 18″	3071	69° 2′ 33″	3067	67° 33′ 43″	3063	66° 4′ 48″	3060
23	α Aquilæ	W.	70 57 55	3745	72 13 55	3725	73 30 16	3706	74 46 57	3687
	Fomalhaut	W.	44 22 54	3587	45 41 42	3548	47 1 13	3512	48 21 24	3478
	Mars	W.	31 40 16	2970	33 11 6	2958	34 42 11	2946	36 13 32	2935
	Saturn	W.	24 43 34	2958	26 14 40	2946	27 46 0	2936	29 17 33	2926
	Aldebaran	E.	58 39 10	3043	57 9 51	3040	55 40 28	3038	54 11 2	3036
24	Fomalhaut	W.	55 11 2	3338	56 34 29	3316	57 58 22	3294	59 22 41	3273
	Mars	W.	43 53 39	2884	45 26 18	2876	46 59 8	2866	48 32 10	2857
	Saturn	W.	36 58 20	2881	38 31 3	2872	40 3 58	2863	41 37 4	2855
	α Pegasi	W.	33 28 25	3621	34 46 37	3558	36 5 57	3502	37 26 19	3452
	Aldebaran	E.	46 43 24	3031	45 13 50	3033	43 44 18	3034	42 14 48	3036
	Pollux	E.	88 46 50	2891	87 14 20	2883	85 41 40	2876	84 8 51	2869
25	Fomalhaut	W.	66 29 58	3183	67 56 28	3167	69 23 17	3151	70 50 25	3137
	Mars	W.	56 20 13	2813	57 54 24	2805	59 28 46	2796	61 3 19	2787
	Saturn	W.	49 25 16	2813	50 59 27	2804	52 33 50	2795	54 8 24	2786
	α Pegasi	W.	44 20 53	3257	45 45 55	3225	47 11 34	3197	48 37 47	3170
	Aldebaran	E.	34 48 42	3073	33 19 59	3087	31 51 33	3103	30 23 27	3124
	Pollux	E.	76 22 20	2831	74 48 32	2823	73 14 34	2815	71 40 26	2807
26	Fomalhaut	W.	78 10 19	3069	79 39 6	3057	81 8 8	3045	82 37 25	3034
	Mars	W.	68 58 59	2743	70 34 42	2733	72 10 38	2724	73 46 46	2714
	Saturn	W.	62 4 9	2742	63 39 53	2732	65 15 50	2722	66 52 0	2713
	α Pegasi	W.	55 56 21	3056	57 25 24	3037	58 54 51	3018	60 24 41	3000
	Pollux	E.	63 47 1	2764	62 11 46	2756	60 36 20	2747	59 0 42	2738
	Sun	F.	135 51 42	3112	134 23 47	3101	132 55 39	3091	131 27 19	3081
27	Fomalhaut	W.	90 7 16	2981	91 37 53	2970	93 8 43	2962	94 39 44	2952
	Mars	W.	81 50 35	2666	83 28 0	2657	85 5 38	2646	86 43 30	2637
	Saturn	W.	74 56 2	2663	76 33 31	2654	78 11 13	2643	79 49 10	2632
	α Pegasi	W.	67 59 20	2917	69 31 17	2901	71 3 34	2887	72 36 10	2872
	α Arietis	W.	24 32 47	2780	26 7 41	2759	27 43 3	2739	29 18 51	2720
	Pollux	E.	50 59 30	2691	49 22 38	2681	47 45 33	2672	46 8 15	2661
	Regulus	E.	87 49 55	2678	86 12 46	2668	84 35 23	2657	82 57 46	2647
	Sun	E.	124 2 24	3026	122 32 44	3016	121 2 51	3005	119 32 44	2993
28	Saturn	W.	88 2 32	2577	89 41 58	2566	91 21 39	2555	93 1 36	2543
	α Arietis	W.	37 23 38	2640	39 1 39	2626	40 39 59	2611	42 18 39	2596
	Pollux	E.	37 58 25	2612	36 19 47	2603	34 40 56	2593	33 1 51	2584
	Regulus	E.	74 46 3	2592	73 6 57	2580	71 27 35	2569	69 47 58	2557
	Sun	E.	111 58 28	2933	110 26 51	2921	108 54 59	2909	107 22 51	2896
29	α Arietis	W.	50 36 51	2527	52 17 27	2513	53 58 22	2499	55 39 36	2486
	Aldobaran	W.	21 14 21	3103	22 42 27	3011	24 12 26	2934	25 44 2	2867
	Regulus	E.	61 25 45	2497	59 44 28	2485	58 2 53	2472	56 21 0	2460
	Sun	E.	99 38 4	2831	98 4 16	2818	96 30 11	2805	94 55 49	2791
30	α Arietis	W.	64 10 33	2419	65 53 41	2405	67 37 9	2391	69 20 56	2378
	Aldebaran	W.	33 40 9	2640	35 18 9	2607	36 56 54	2577	38 36 20	2550
	Regulus	E.	47 47 11	2396	46 3 31	2383	44 19 32	2371	42 35 15	2358
	Sun	E.	86 59 31	2723	85 23 22	2709	83 46 54	2695	82 10 8	2682

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Aldebaran	E.	64° 35′ 49″	3056	63° 6′ 46″	3052	61° 37′ 38″	3049	60° 8′ 26″	3046
23	α Aquilæ	W.	76 3 58	3670	77 21 17	3655	78 38 52	3639	79 56 44	3625
	Fomalhaut	W.	49 42 13	3446	51 3 37	3416	52 25 35	3389	53 48 4	3364
	Mars	W.	37 45 7	2924	39 16 56	2913	40 48 58	2904	42 21 12	2894
	Saturn	W.	30 49 19	2916	32 21 17	2907	33 53 27	2898	35 25 48	2890
	Aldebaran	E.	52 41 34	3034	51 12 3	3033	49 42 31	3032	48 12 58	3031
24	Fomalhaut	W.	60 47 24	3253	62 12 30	3235	63 37 58	3216	65 3 48	3199
	Mars	W.	50 5 24	2848	51 38 49	2839	53 12 26	2831	54 46 14	2822
	Saturn	W.	43 10 20	2846	44 43 48	2838	46 17 26	2830	47 51 15	2821
	α Pegasi	W.	38 47 37	3406	40 9 47	3363	41 32 46	3325	42 56 29	3289
	Aldebaran	E.	40 45 22	3041	39 16 0	3047	37 46 45	3053	36 17 38	3062
	Pollux	E.	82 35 52	2862	81 2 44	2854	79 29 26	2846	77 55 58	2838
25	Fomalhaut	W.	72 17 50	3122	73 45 33	3109	75 13 32	3095	76 41 48	3082
	Mars	W.	62 38 4	2779	64 13 0	2769	65 48 8	2760	67 23 28	2752
	Saturn	W.	55 43 10	2778	57 18 7	2769	58 53 16	2760	60 28 37	2751
	α Pegasi	W.	50 4 32	3144	51 31 48	3121	52 59 32	3099	54 27 43	3077
	Aldebaran	E.	28 55 47	3150	27 28 38	3181	26 2 6	3220	24 36 21	3270
	Pollux	E.	70 6 7	2798	68 31 37	2790	66 56 56	2782	65 22 4	2773
26	Fomalhaut	W.	84 6 56	3022	85 36 41	3011	87 6 40	3001	88 36 52	2991
	Mars	W.	75 23 7	2705	76 59 40	2696	78 36 25	2687	80 13 23	2676
	Saturn	W.	68 28 22	2704	70 4 57	2694	71 41 45	2684	73 18 47	2674
	α Pegasi	W.	61 54 54	2982	63 25 29	2965	64 56 25	2949	66 27 42	2932
	Pollux	E.	57 24 52	2729	55 48 50	2719	54 12 36	2710	52 36 9	2701
	Sun	E.	129 58 46	3071	128 30 1	3060	127 1 2	3049	125 31 50	3038
27	Fomalhaut	W.	96 10 57	2943	97 42 21	2935	99 13 55	2927	100 45 40	2919
	Mars	W.	88 21 35	2626	89 59 54	2615	91 38 28	2605	93 17 16	2595
	Saturn	W.	81 27 21	2621	83 5 47	2611	84 44 27	2600	86 23 22	2589
	α Pegasi	W.	74 9 5	2858	75 42 18	2844	77 15 49	2830	78 49 38	2816
	α Arietis	W.	30 55 4	2703	32 31 40	2687	34 8 38	2670	35 45 58	2655
	Pollux	E.	44 30 43	2652	42 52 59	2642	41 15 1	2632	39 36 50	2622
	Regulus	E.	81 19 55	2636	79 41 49	2626	78 3 29	2615	76 24 54	2603
	Sun	E.	118 2 22	2981	116 31 46	2969	115 0 55	2958	113 29 49	2946
28	Saturn	W.	94 41 49	2532	96 22 18	2520	98 3 4	2508	99 44 6	2495
	α Arietis	W.	43 57 39	2583	45 36 58	2569	47 16 36	2554	48 56 34	2540
	Pollux	E.	31 22 34	2574	29 43 4	2566	28 3 22	2558	26 23 29	2550
	Regulus	E.	68 8 4	2545	66 27 54	2534	64 47 28	2522	63 6 45	2510
	Sun	E.	105 50 27	2883	104 17 46	2870	102 44 49	2857	101 11 35	2844
29	α Arietis	W.	57 21 9	2472	59 3 1	2458	60 45 13	2445	62 27 44	2432
	Aldebaran	W.	27 17 3	2810	28 51 18	2760	30 26 38	2716	32 2 57	2676
	Regulus	E.	54 38 50	2447	52 56 22	2435	51 13 37	2422	49 30 33	2409
	Sun	E.	93 21 9	2777	91 46 11	2764	90 10 56	2750	88 35 23	2736
30	α Arietis	W.	71 5 2	2365	72 49 27	2352	74 34 11	2339	76 19 13	2326
	Aldebaran	W.	40 16 24	2523	41 57 5	2499	43 38 20	2476	45 20 7	2454
	Regulus	E.	40 50 40	2345	39 5 46	2333	37 20 34	2320	35 35 3	2307
	Sun	E.	80 33 4	2669	78 55 42	2655	77 18 1	2641	75 40 2	2626

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be subtracted from Apparent Time.*	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	12 30 49.16	9.062	S. 3 19 46.1	–58.26	16 1.57	64.37	10 26.62	0.792
Tues.	2	12 34 26.82	9.076	3 43 3.4	58.18	16 1.84	64.42	10 45.45	0.778
Wed.	3	12 38 4.81	9.090	4 6 18.2	58.05	16 2.12	64.47	11 3.96	0.764
Thur.	4	12 41 43.14	9.105	4 29 30.0	57.92	16 2.40	64.52	11 22.14	0.749
Frid.	5	12 45 21.84	9.120	4 52 38.8	57.78	16 2.67	64.57	11 39.95	0.734
Sat.	6	12 49 0.93	9.137	5 15 43.9	57.62	16 2.95	64.63	11 57.37	0.717
Sun.	7	12 52 40.43	9.154	5 38 45.1	57.45	16 3.22	64.69	12 14.38	0.700
Mon.	8	12 56 20.34	9.172	6 1 41.9	57.26	16 3.50	64.75	12 30.97	0.682
Tues.	9	13 0 0.68	9.190	6 24 33.9	57.06	16 3.78	64.82	12 47.13	0.664
Wed.	10	13 3 41.48	9.209	6 47 20.8	56.83	16 4.06	64.89	13 2.85	0.645
Thur.	11	13 7 22.75	9.229	7 10 2.0	56.59	16 4.34	64.96	13 18.09	0.625
Frid.	12	13 11 4.50	9.250	7 32 37.3	56.34	16 4.62	65.04	13 32.85	0.604
Sat.	13	13 14 46.74	9.271	7 55 6.2	56.07	16 4.91	65.12	13 47.11	0.583
Sun.	14	13 18 29.49	9.293	8 17 28.6	55.78	16 5.19	65.20	14 0.88	0.561
Mon.	15	13 22 12.78	9.315	8 39 43.8	55.47	16 5.47	65.28	14 14.11	0.541
Tues.	16	13 25 56.63	9.338	9 1 51.4	55.15	16 5.75	65.36	14 26.78	0.516
Wed.	17	13 29 41.05	9.362	9 23 51.3	54.82	16 6.03	65.45	14 38.88	0.492
Thur.	18	13 33 26.05	9.387	9 45 42.9	54.48	16 6.31	65.54	14 50.40	0.467
Frid.	19	13 37 11.66	9.413	10 7 26.0	54.11	16 6.58	65.63	15 1.31	0.441
Sat.	20	13 40 57.90	9.439	10 29 0.2	53.73	16 6.86	65.72	15 11.61	0.415
Sun.	21	13 44 44.78	9.466	10 50 25.0	53.33	16 7.13	65.82	15 21.27	0.388
Mon.	22	13 48 32.32	9.494	11 11 40.2	52.92	16 7.40	65.92	15 30.25	0.360
Tues.	23	13 52 20.55	9.524	11 32 45.3	52.49	16 7.66	66.02	15 38.54	0.331
Wed.	24	13 56 9.47	9.554	11 53 40.0	52.05	16 7.92	66.12	15 46.14	0.301
Thur.	25	13 59 59.12	9.584	12 14 24.0	51 59	16 8.18	66.23	15 53.04	0.271
Frid.	26	14 3 49.51	9.615	12 34 56.6	51.12	16 8.44	66.33	15 59.20	0.240
Sat.	27	14 7 40.65	9.647	12 55 17.8	50.63	16 8.69	66.44	16 4.60	0.208
Sun.	28	14 11 32.56	9.679	13 15 26.9	50.12	16 8.94	66.55	16 9.23	0.176
Mon.	29	14 15 25.25	9.711	13 35 23.7	49.60	16 9.19	66.66	16 13.09	0.144
Tues.	30	14 19 18.73	9.744	13 55 7.7	49.05	16 9.44	66.77	16 16.16	0.111
Wed.	31	14 23 13.02	9.778	14 14 38.6	48.49	16 9.68	66.88	16 18.41	0.077
Thur.	32	14 27 8.13	9.812	S. 14 33 55.7	–47.91	16 9.93	66.99	16 19.85	0.043

Note.—Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, *to be added to Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	12 30 50.72	9.064	S. 3 19 56.2	−58.27	10 26.75	0.792	12 41 17.47
Tues.	2	12 34 28.43	9.078	3 43 13.7	58.17	10 45.59	0.778	12 45 14.02
Wed.	3	12 38 6.47	9.092	4 6 28.7	58.06	11 4.10	0.764	12 49 10.57
Thur.	4	12 41 44.85	9.107	4 29 40.8	57.93	11 22.28	0.749	12 53 7.13
Frid.	5	12 45 23.59	9.122	4 52 49.9	57.79	11 40.09	0.734	12 57 3.68
Sat.	6	12 49 2.73	9.139	5 15 55.3	57.63	11 57.51	0.717	13 1 0.24
Sun.	7	12 52 42.28	9.156	5 38 56.7	57.46	12 14.51	0.700	13 4 56.79
Mon.	8	12 56 22.24	9.174	6 1 53.7	57.27	12 31.11	0.682	13 8 53.35
Tues.	9	13 0 2.63	9.192	6 24 46.0	57.07	12 47.27	0.664	13 12 49.90
Wed.	10	13 3 43.47	9.211	6 47 33.1	56.84	13 2.99	0.645	13 16 46.46
Thur.	11	13 7 24.78	9.231	7 10 14.5	56.60	13 18.23	0.625	13 20 43.01
Frid.	12	13 11 6.57	9.252	7 32 50.0	56.35	13 32.99	0.604	13 24 39.56
Sat.	13	13 14 48.86	9.273	7 55 19.1	56.08	13 47.25	0.583	13 28 36.11
Sun.	14	13 18 31.65	9.295	8 17 41.6	55.79	14 1.02	0.561	13 32 32.67
Mon.	15	13 22 14.98	9.317	8 39 56.9	55.48	14 14.24	0.541	13 36 29.22
Tues.	16	13 25 58.87	9.340	9 2 4.6	55.16	14 26.91	0.516	13 40 25.78
Wed.	17	13 29 43.32	9.364	9 24 4.6	54.83	14 39.01	0.492	13 44 22.33
Thur.	18	13 33 28.36	9.389	9 45 56.3	54.48	14 50.53	0.467	13 48 18.89
Frid.	19	13 37 14.01	9.415	10 7 39.5	54.11	15 1.43	0.441	13 52 15.44
Sat.	20	13 41 0.28	9.441	10 29 13.8	53.73	15 11.72	0.415	13 56 12.00
Sun.	21	13 44 47.19	9.468	10 50 38.7	53.33	15 21.36	0.388	14 0 8.55
Mon.	22	13 48 34.76	9.496	11 11 53.9	52.92	15 30.34	0.360	14 4 5.10
Tues.	23	13 52 23.02	9.525	11 32 59.0	52.49	15 38.63	0.331	14 8 1.65
Wed.	24	13 56 11.97	9.555	11 53 53.7	52.05	15 46.24	0.301	14 11 58.21
Thur.	25	14 0 1.65	9.585	12 14 37.6	51.59	15 53.11	0.271	14 15 54.76
Frid.	26	14 3 52.06	9.616	12 35 10.2	51.12	15 59.26	0.240	14 19 51.32
Sat.	27	14 7 43.22	9.648	12 55 31.3	50.63	16 4.65	0.208	14 23 47.87
Sun.	28	14 11 35.15	9.680	13 15 40.4	50.12	16 9.28	0.176	14 27 44.43
Mon.	29	14 15 27.86	9.712	13 35 37.1	49.60	16 13.13	0.144	14 31 40.99
Tues.	30	14 19 21.36	9.745	13 55 21.0	49.05	16 16.19	0.111	14 35 37.55
Wed.	31	14 23 15.67	9.779	14 14 51.7	48.49	16 18.43	0.077	14 39 34.10
Thur.	32	14 27 10.79	9.813	S. 14 34 8.8	−47.91	16 19.87	0.043	14 43 30.66

Note.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.
$+9^s.8565$

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	274	188 24 7.7	23 21.8	147.71	+0.11	0.0001921	-51.1	11 16 51.35
2	275	189 23 14.0	22 27.9	147.80	−0.02	0.0000693	51.3	11 12 55.44
3	276	190 22 22.6	21 36.3	147.90	0.16	9.9999460	51.5	11 8 59.53
4	277	191 21 33.5	20 47.1	147.99	0.29	.9998223	51.6	11 5 3.62
5	278	192 20 46.6	20 0.1	148.09	0.42	.9996983	51.8	11 1 7.71
6	279	193 20 1.9	19 15.3	148.18	0.55	.9995737	52.1	10 57 11.81
7	280	194 19 19.3	18 32.6	148.27	0.66	.9994485	52.3	10 53 15.90
8	281	195 18 38.7	17 51.9	148.36	0.73	.9993228	52.5	10 49 19.99
9	282	196 18 0.1	17 13.2	148.44	0.79	.9991966	52.7	10 45 24.08
10	283	197 17 23.5	16 36.5	148.52	0.80	.9990699	52.8	10 41 28.17
11	284	198 16 48.7	16 1.6	148.59	0.80	.9989430	52.9	10 37 32.26
12	285	199 16 15.7	15 28.5	148.67	0.75	.9988161	52.9	10 33 36.35
13	286	200 15 44.5	14 57.2	148.74	0.70	.9986892	52.9	10 29 40.44
14	287	201 15 15.1	14 27.7	148.81	0.59	.9985624	52.8	10 25 44.54
15	288	202 14 47.4	13 59.9	148.88	0.49	.9984359	52.6	10 21 48.63
16	289	203 14 21.4	13 33.8	148.96	0.37	.9983100	52.4	10 17 52.73
17	290	204 13 57.2	13 9.4	149.03	0.24	.9981847	52.1	10 13 56.82
18	291	205 13 34.9	12 47.0	149.11	−0.10	.9980602	51.7	10 10 0.91
19	292	206 13 14.4	12 26.4	149.18	+0.01	.9979366	51.3	10 6 5.00
20	293	207 12 55.7	12 7.6	149.26	0.11	.9978141	50.8	10 2 9.09
21	294	208 12 38.9	11 50.7	149.34	0.20	.9976927	50.3	9 58 13.18
22	295	209 12 24.0	11 35.6	149.42	0.26	.9975726	49.8	9 54 17.28
23	296	210 12 11 0	11 22.5	149.50	0.28	.9974538	49.3	9 50 21.37
24	297	211 12 0.1	11 11.5	149.59	0.28	.9973363	48.8	9 46 25.46
25	298	212 11 51.3	11 2.6	149.68	0.24	.9972200	48.2	9 42 29.55
26	299	213 11 44.7	10 55.8	149.77	0.18	.9971049	47.7	9 38 33.64
27	300	214 11 40.3	10 51.2	149.86	+0.10	.9969910	47.2	9 34 37.73
28	301	215 11 38.1	10 48.8	149.95	−0.02	.9968782	46.8	9 30 41.82
29	302	216 11 38.1	10 48.6	150.04	0.14	.9967664	46.4	9 26 45.91
30	303	217 11 40.2	10 50.6	150.13	0.28	.9966554	46.0	9 22 50.00
31	304	218 11 44.5	10 54.8	150.22	0.42	.9965453	45.7	9 18 54.09
32	305	219 11 50.9	11 1.1	150.31	−0.56	9.9964359	-45.4	9 14 58.18

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9^{s}.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 9.8	16 15.0	59 12.8	+1.63	59 31.8	+1.53	19 52.0	2.34	24.0
2	16 19.8	16 24.1	59 49.4	1.40	60 5.1	1.22	20 46.9	2.23	25.0
3	16 27.7	16 30.6	60 18.5	1.00	60 29.0	0.74	21 39.4	2.14	26.0
4	16 32.5	16 33.5	60 36.1	+0.45	60 39.6	+0.13	22 30.3	2.10	27.0
5	16 33.4	16 32.2	60 39.2	−0.20	60 34.7	−0.54	23 20.7	2.11	28.0
6	16 29.8	16 26.5	60 26.2	0.87	60 13.8	1.19	6		29.0
7	16 22.1	16 16.9	59 57.8	1.47	59 38.6	1.72	0 11.8	2.16	0.6
8	16 10.9	15 4.3	59 16.6	1.93	58 52.5	2.08	1 4.6	2.24	1.6
9	15 57.3	15 50.0	58 26.8	2.18	58 0.2	2.23	1 59.4	2.32	2.6
10	15 42.8	15 35.5	57 33.4	2.23	57 6.8	2.19	2 55.8	2.37	3.6
11	15 28.5	15 21.8	56 41.0	2.11	56 16.4	1.99	3 52.6	2.35	4.6
12	15 15.5	15 9.8	55 53.4	1.84	55 32.4	1.66	4 48.2	2.27	5.6
13	15 4.7	15 0.2	55 13.5	1.48	54 57.0	1.28	5 41.1	2.13	6.6
14	14 56.3	14 53.2	54 42.8	1.08	54 31.2	0.87	6 30.5	1.98	7.6
15	14 50.7	14 48.9	54 22.0	0.66	54 15.4	0.45	7 16.6	1.85	8.6
16	14 47.7	14 47.3	54 11.2	−0.25	54 9.4	−0.05	7 59.6	1.74	9.6
17	14 47.4	14 48.1	54 9.9	+0.14	54 12.6	+0.31	8 40.5	1.67	10.6
18	14 49.3	14 51.1	54 17.2	0.47	54 23.7	0.61	9 20.3	1.65	11.6
19	14 53.4	14 56.0	54 31.8	0.74	54 41.4	0.85	10 0.0	1.67	12.6
20	14 58.9	15 2.1	54 52.2	0.94	55 4.0	1.02	10 40.7	1.73	13.6
21	15 5.5	15 9.2	55 16.7	1.09	55 30.0	1.14	11 23.5	1.84	14.6
22	15 13.0	15 16.8	55 43.9	1.17	55 58.1	1.20	12 9.3	1.99	15.6
23	15 20.8	15 24.7	56 12.6	1.21	56 27.1	1.21	12 59.0	2.16	16.6
24	15 28.7	15 32.6	56 41.7	1.21	56 56.2	1.20	13 52.9	2.33	17.6
25	15 36.6	15 40.4	57 10.6	1.20	57 24.9	1.19	14 50.2	2.45	18.6
26	15 44.3	15 48.1	57 39.1	1.17	57 53.0	1.15	15 49.5	2.48	19.6
27	15 51.8	15 55.5	58 6.7	1.13	58 20.1	1.10	16 48.6	2.43	20.6
28	15 59.0	16 2.5	58 33.1	1.07	58 45.7	1.03	17 45.6	2.32	21.6
29	16 5.7	16 8.8	58 57.8	0.98	59 9.1	0.91	18 39.9	2.20	22.6
30	16 11.6	16 14.2	59 19.5	0.82	59 28.7	0.71	19 31.4	2.09	23.6
31	16 16.3	16 17.9	59 36.4	0.58	59 42.4	0.42	20 20.9	2.04	24.6
32	16 19.0	16 19.4	59 46.3	+0.23	59 47.9	+0.03	21 9.7	2.04	25.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 47 36.77	2.5010	N.24 18 44.5	8.882
1	7 50 6.73	2.4976	24 9 46.7	9.044
2	7 52 36.48	2.4940	24 0 39.2	9.205
3	7 55 6.01	2.4903	23 51 22.1	9.364
4	7 57 35.32	2.4867	23 41 55.5	9.522
5	8 0 4.41	2.4830	23 32 19.4	9.680
6	8 2 33.28	2.4792	23 22 33.9	9.836
7	8 5 1.92	2.4753	23 12 39.1	9.991
8	8 7 30.32	2.4714	23 2 35.0	10.145
9	8 9 58.49	2.4676	22 52 21.7	10.297
10	8 12 26.43	2.4637	22 41 59.3	10.449
11	8 14 54.13	2.4596	22 31 27.8	10.599
12	8 17 21.58	2.4555	22 20 47.4	10.748
13	8 19 48.79	2.4514	22 9 58.1	10.896
14	8 22 15.75	2.4473	21 58 59.9	11.043
15	8 24 42.47	2.4432	21 47 52.9	11.188
16	8 27 8.93	2.4389	21 36 37.3	11.332
17	8 29 35.14	2.4347	21 25 13.1	11.474
18	8 32 1.10	2.4305	21 13 40.4	11.616
19	8 34 26.80	2.4262	21 1 59.2	11.756
20	8 36 52.25	2.4220	20 50 9.7	11.894
21	8 39 17.44	2.4177	20 38 11.9	12.032
22	8 41 42.37	2.4134	20 26 5.9	12.167
23	8 44 7.05	2.4092	N.20 13 51.9	12.301

TUESDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 46 31.47	2.4048	N.20 1 29.8	12.434
1	8 48 55.63	2.4005	19 48 59.8	12.565
2	8 51 19.53	2.3962	19 36 22.0	12.695
3	8 53 43.17	2.3918	19 23 36.4	12.824
4	8 56 6.55	2.3875	19 10 43.1	12.951
5	8 58 29.67	2.3832	18 57 42.3	13.076
6	9 0 52.54	2.3790	18 44 34.0	13.200
7	9 3 15.15	2.3747	18 31 18.3	13.322
8	9 5 37.50	2.3703	18 17 55.3	13.442
9	9 7 59.59	2.3661	18 4 25.2	13.562
10	9 10 21.43	2.3618	17 50 47.9	13.680
11	9 12 43.01	2.3576	17 37 3.6	13.796
12	9 15 4.34	2.3534	17 23 12.4	13.910
13	9 17 25.41	2.3492	17 9 14.4	14.022
14	9 19 46.24	2.3451	16 55 9.7	14.134
15	9 22 6.82	2.3409	16 40 58.3	14.244
16	9 24 27.15	2.3368	16 26 40.4	14.352
17	9 26 47.23	2.3327	16 12 16.1	14.458
18	9 29 7.07	2.3286	15 57 45.5	14.563
19	9 31 26.66	2.3246	15 43 8.6	14.666
20	9 33 46.02	2.3207	15 28 25.6	14.766
21	9 36 5.14	2.3167	15 13 36.7	14.864
22	9 38 24.03	2.3128	14 58 41.9	14.962
23	9 40 42.68	2.3089	14 43 41.2	15.059
24	9 43 1.10	2.3051	N.14 28 34.8	15.153

WEDNESDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 43 1.10	2.3051	N.14 28 34.8	15.153
1	9 45 19.29	2.3013	14 13 22.8	15.246
2	9 47 37.26	2.2976	13 58 5.3	15.337
3	9 49 55.00	2.2939	13 42 42.4	15.426
4	9 52 12.53	2.2903	13 27 14.2	15.513
5	9 54 29.84	2.2867	13 11 40.8	15.599
6	9 56 46.93	2.2831	12 56 2.3	15.683
7	9 59 3.81	2.2796	12 40 18.	15.765
8	10 1 20.49	2.2762	12 24 30.5	15.845
9	10 3 36.96	2.2728	12 8 37.4	15.923
10	10 5 53.23	2.2696	11 52 39.7	16.000
11	10 8 9.31	2.2663	11 36 37.4	16.075
12	10 10 25.19	2.2631	11 20 30.7	16.148
13	10 12 40.88	2.2600	11 4 19.7	16.219
14	10 14 56.39	2.2569	10 48 4.4	16.289
15	10 17 11.71	2.2538	10 31 45.0	16.357
16	10 19 26.85	2.2509	10 15 21.6	16.422
17	10 21 41.82	2.2480	9 58 54.3	16.486
18	10 23 56.61	2.2451	9 42 23.3	16.548
19	10 26 11.23	2.2423	9 25 48.6	16.608
20	10 28 25.69	2.2397	9 9 10.3	16.667
21	10 30 40.00	2.2372	8 52 28.6	16.723
22	10 32 54.15	2.2346	8 35 43.5	16.778
23	10 35 8.15	2.2321	N. 8 18 55.2	16.831

THURSDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 37 22.00	2.2297	N. 8 2 3.8	16.882
1	10 39 35.71	2.2273	7 45 9.4	16.931
2	10 41 49.28	2.2250	7 28 12.1	16.978
3	10 44 2.71	2.2228	7 11 12.0	17.024
4	10 46 16.01	2.2207	6 54 9.2	17.067
5	10 48 29.19	2.2186	6 37 3.9	17.109
6	10 50 42.24	2.2165	6 19 56.1	17.149
7	10 52 55.17	2.2147	6 2 46.0	17.167
8	10 55 8.00	2.2129	5 45 33.7	17.223
9	10 57 20.72	2.2112	5 28 19.3	17.257
10	10 59 33.34	2.2095	5 11 2.9	17.289
11	11 1 45.86	2.2078	4 53 44.6	17.319
12	11 3 58.28	2.2062	4 36 24.6	17.347
13	11 6 10.61	2.2048	4 19 2.9	17.374
14	11 8 22.86	2.2035	4 1 39.7	17.399
15	11 10 35.03	2.2022	3 44 15.0	17.422
16	11 12 47.12	2.2009	3 26 49.0	17.442
17	11 14 59.13	2.1997	3 9 21.9	17.461
18	11 17 11.08	2.1987	2 51 3.7	17.478
19	11 19 22.97	2.1977	2 34 24.5	17.493
20	11 21 34.80	2.1967	2 16 54.5	17.507
21	11 23 46.57	2.1959	1 59 23.7	17.518
22	11 25 58.30	2.1952	1 41 52.3	17.528
23	11 28 9.99	2.1945	1 24 20.4	17.536
24	11 30 21.64	2.1938	N. 1 6 48.0	17.542

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 30 21.64	2.1938	N. 1 6 48.0	17.542
1	11 32 33.25	2.1933	0 49 15.4	17.545
2	11 34 44.84	2.1929	0 31 42.6	17.547
3	11 36 56.40	2.1925	N. 0 14 9.8	17.546
4	11 39 7.94	2.1922	S. 0 3 22.9	17.544
5	11 41 19.46	2.1919	0 20 55.5	17.541
6	11 43 30.97	2.1918	0 38 27.8	17.535
7	11 45 42.48	2.1917	0 55 59.7	17.527
8	11 47 53.98	2.1917	1 13 31.1	17.517
9	11 50 5.48	2.1918	1 31 1.8	17.506
10	11 52 16.99	2.1920	1 48 31.8	17.493
11	11 54 28.52	2.1922	2 6 0.9	17.478
12	11 56 40.06	2.1925	2 23 29.1	17.461
13	11 58 51.62	2.1929	2 40 56.2	17.442
14	12 1 3.21	2.1934	2 58 22.1	17.421
15	12 3 14.83	2.1940	3 15 46.7	17.398
16	12 5 26.49	2.1946	3 33 9.8	17.373
17	12 7 38.18	2.1952	3 50 31.4	17.347
18	12 9 49.91	2.1959	4 7 51.4	17.318
19	12 12 1.69	2.1968	4 25 9.6	17.288
20	12 14 13.53	2.1977	4 42 25.9	17.256
21	12 16 25.42	2.1987	4 59 40.3	17.222
22	12 18 37.37	2.1997	5 16 52.6	17.186
23	12 20 49.39	2.2008	S. 5 34 2.6	17.148

SATURDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 23 1.47	2.2020	S. 5 51 10.3	17.108
1	12 25 13.63	2.2033	6 8 15.6	17.067
2	12 27 25.87	2.2046	6 25 18.4	17.024
3	12 29 38.18	2.2059	6 42 18.5	16.978
4	12 31 50.58	2.2074	6 59 15.8	16.932
5	12 34 3.07	2.2090	7 16 10.3	16.883
6	12 36 15.66	2.2107	7 33 1.8	16.832
7	12 38 28.35	2.2123	7 49 50.2	16.780
8	12 40 41.14	2.2140	8 6 35.4	16.726
9	12 42 54.03	2.2158	8 23 17.3	16.670
10	12 45 7.03	2.2176	8 39 55.8	16.612
11	12 47 20.14	2.2195	8 56 30.7	16.552
12	12 49 33.37	2.2215	9 13 2.0	16.491
13	12 51 46.72	2.2235	9 29 29.6	16.428
14	12 54 0.19	2.2256	9 45 53.3	16.363
15	12 56 13.79	2.2277	10 2 13.1	16.297
16	12 58 27.52	2.2299	10 18 28.9	16.228
17	13 0 41.38	2.2321	10 34 40.5	16.157
18	13 2 55.37	2.2344	10 50 47.8	16.085
19	13 5 9.51	2.2368	11 6 50.7	16.012
20	13 7 23.79	2.2392	11 22 49.2	15.937
21	13 9 38.21	2.2416	11 38 43.1	15.859
22	13 11 52.78	2.2442	11 54 32.3	15.781
23	13 14 7.51	2.2467	12 10 16.8	15.700
24	13 16 22.39	2.2492	S. 12 25 56.3	15.617

SUNDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 16 22.39	2.2492	S. 12 25 56.3	15.617
1	13 18 37.42	2.2519	12 41 30.8	15.533
2	13 20 52.62	2.2546	12 57 0.3	15.448
3	13 23 7.98	2.2573	13 12 24.6	15.361
4	13 25 23.50	2.2601	13 27 43.6	15.272
5	13 27 39.19	2.2629	13 42 57.2	15.182
6	13 29 55.05	2.2657	13 58 5.4	15.090
7	13 32 11.08	2.2686	14 13 8.0	14.996
8	13 34 27.28	2.2715	14 28 4.9	14.900
9	13 36 43.66	2.2745	14 42 56.0	14.803
10	13 39 0.22	2.2775	14 57 41.3	14.705
11	13 41 16.96	2.2805	15 12 20.6	14.604
12	13 43 33.88	2.2835	15 26 53.8	14.502
13	13 45 50.98	2.2866	15 41 20.9	14.400
14	13 48 8.27	2.2897	15 55 41.8	14.295
15	13 50 25.74	2.2927	16 9 56.3	14.188
16	13 52 43.40	2.2958	16 24 4.4	14.081
17	13 55 1.24	2.2989	16 38 6.0	13.972
18	13 57 19.27	2.3021	16 52 1.0	13.861
19	13 59 37.49	2.3053	17 5 49.3	13.748
20	14 1 55.90	2.3085	17 19 30.8	13.635
21	14 4 14.51	2.3117	17 33 5.5	13.520
22	14 6 33.31	2.3149	17 46 33.2	13.403
23	14 8 52.30	2.3181	S. 17 59 53.9	13.286

MONDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 11 11.48	2.3213	S. 18 13 7.5	13.167
1	14 13 30.85	2.3245	18 26 13.9	13.046
2	14 15 50.42	2.3277	18 39 13.0	12.923
3	14 18 10.18	2.3310	18 52 4.7	12.800
4	14 20 30.14	2.3342	19 4 49.0	12.676
5	14 22 50.29	2.3374	19 17 25.8	12.550
6	14 25 10.63	2.3406	19 29 55.0	12.423
7	14 27 31.16	2.3438	19 42 16.5	12.294
8	14 29 51.89	2.3471	19 54 30.3	12.164
9	14 32 12.81	2.3502	20 6 36.2	12.032
10	14 34 33.92	2.3533	20 18 34.2	11.900
11	14 36 55.21	2.3564	20 30 24.2	11.767
12	14 39 16.69	2.3596	20 42 6.2	11.633
13	14 41 38.36	2.3627	20 53 40.1	11.497
14	14 44 0.21	2.3657	21 5 5.8	11.359
15	14 46 22.25	2.3688	21 16 23.2	11.221
16	14 48 44.47	2.3718	21 27 32.3	11.082
17	14 51 6.87	2.3748	21 38 33.1	10.942
18	14 53 29.45	2.3778	21 49 25.4	10.801
19	14 55 52.21	2.3807	22 0 9.2	10.658
20	14 58 15.14	2.3836	22 10 44.4	10.515
21	15 0 38.24	2.3864	22 21 11.0	10.371
22	15 3 1.51	2.3892	22 31 28.9	10.226
23	15 5 24.94	2.3919	22 41 38.1	10.080
24	15 7 48.54	2.3946	S. 22 51 38.5	9.932

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 7 48.54	2.3946	S. 22 51 38.5	9.932
1	15 10 12.30	2.3973	23 1 30.0	9.784
2	15 12 36.22	2.3999	23 11 12.6	9.635
3	15 15 0.29	2.4025	23 20 46.2	9.485
4	15 17 24.52	2.4050	23 30 10.8	9.334
5	15 19 48.89	2.4074	23 39 26.3	9.182
6	15 22 13.41	2.4098	23 48 32.7	9.030
7	15 24 38.07	2.4122	23 57 29.9	8.877
8	15 27 2.87	2.4144	24 6 17.9	8.723
9	15 29 27.80	2.4166	24 14 56.7	8.569
10	15 31 52.86	2.4187	24 23 26.2	8.413
11	15 34 18.04	2.4207	24 31 46.3	8.257
12	15 36 43.35	2.4227	24 39 57.0	8.100
13	15 39 8.77	2.4247	24 47 58.3	7.943
14	15 41 34.31	2.4266	24 55 50.2	7.786
15	15 43 59.96	2.4283	25 3 32.6	7.627
16	15 46 25.71	2.4299	25 11 5.4	7.468
17	15 48 51.55	2.4315	25 18 28.7	7.308
18	15 51 17.49	2.4331	25 25 42.4	7.148
19	15 53 43.52	2.4345	25 32 46.5	6.988
20	15 56 9.63	2.4358	25 39 40.9	6.827
21	15 58 35.82	2.4371	25 46 25.7	6.666
22	16 1 2.09	2.4383	25 53 0.8	6.503
23	16 3 28.42	2.4394	S. 25 59 26.1	6.341

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 5 54.82	2.4405	S. 26 5 41.7	6.178
1	16 8 21.28	2.4413	26 11 47.5	6.016
2	16 10 47.78	2.4421	26 17 43.6	5.853
3	16 13 14.33	2.4428	26 23 29.9	5.690
4	16 15 40.92	2.4434	26 29 6.4	5.526
5	16 18 7.54	2.4439	26 34 33.0	5.362
6	16 20 34.19	2.4444	26 39 49.8	5.198
7	16 23 0.87	2.4448	26 44 56.8	5.034
8	16 25 27.57	2.4451	26 49 53.9	4.869
9	16 27 54.28	2.4452	26 54 41.1	4.704
10	16 30 20.99	2.4451	26 59 18.4	4.540
11	16 32 47.69	2.4450	27 3 45.9	4.376
12	16 35 14.39	2.4448	27 8 3.5	4.211
13	16 37 41.07	2.4445	27 12 11.2	4.046
14	16 40 7.73	2.4442	27 16 9.0	3.882
15	16 42 34.37	2.4437	27 19 57.0	3.717
16	16 45 0.98	2.4431	27 23 35.1	3.552
17	16 47 27.54	2.4423	27 27 3.3	3.387
18	16 49 54.05	2.4414	27 30 21.6	3.223
19	16 52 20.51	2.4406	27 33 30.1	3.059
20	16 54 46.92	2.4396	27 36 28.7	2.895
21	16 57 13.26	2.4384	27 39 17.5	2.732
22	16 59 39.52	2.4371	27 41 56.5	2.568
23	17 2 5.71	2.4358	27 44 25.7	2.404
24	17 4 31.82	2.4344	S. 27 46 45.0	2.240

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 4 31.82	2.4344	S. 27 46 45.0	2.240
1	17 6 57.84	2.4328	27 48 54.5	2.078
2	17 9 23.76	2.4311	27 50 54.3	1.916
3	17 11 49.57	2.4293	27 52 44.4	1.754
4	17 14 15.27	2.4274	27 54 24.8	1.592
5	17 16 40.86	2.4255	27 55 55.4	1.429
6	17 19 6.33	2.4234	27 57 16.3	1.268
7	17 21 31.67	2.4212	27 58 27.6	1.107
8	17 23 56.87	2.4189	27 59 29.2	0.947
9	17 26 21.94	2.4166	28 0 21.2	0.787
10	17 28 46.86	2.4140	28 1 3.7	0.628
11	17 31 11.62	2.4114	28 1 36.6	0.469
12	17 33 36.22	2.4087	28 2 0.0	0.311
13	17 36 0.66	2.4059	28 2 13.9	−0.153
14	17 38 24.93	2.4030	28 2 18.4	+0.004
15	17 40 49.02	2.4000	28 2 13.4	0.162
16	17 43 12.93	2.3969	28 1 59.0	0.318
17	17 45 36.65	2.3937	28 1 35.3	0.472
18	17 48 0.18	2.3905	28 1 2.4	0.626
19	17 50 23.51	2.3871	28 0 20.2	0.781
20	17 52 46.63	2.3837	27 59 28.7	0.935
21	17 55 9.55	2.3802	27 58 28.0	1.087
22	17 57 32.26	2.3766	27 57 18.2	1.239
23	17 59 54.74	2.3728	S. 27 55 59.3	1.391

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 2 16.99	2.3689	S. 27 54 31.3	1.542
1	18 4 39.01	2.3651	27 52 54.3	1.691
2	18 7 0.80	2.3612	27 51 8.4	1.840
3	18 9 22.35	2.3571	27 49 13.5	1.989
4	18 11 43.65	2.3529	27 47 9.7	2.137
5	18 14 4.70	2.3487	27 44 57.1	2.284
6	18 16 25.50	2.3445	27 42 35.7	2.430
7	18 18 46.04	2.3401	27 40 5.5	2.575
8	18 21 6.31	2.3357	27 37 26.7	2.718
9	18 23 26.32	2.3312	27 34 39.3	2.862
10	18 25 46.06	2.3267	27 31 43.3	3.005
11	18 28 5.52	2.3221	27 28 38.7	3.147
12	18 30 24.71	2.3175	27 25 25.7	3.287
13	18 32 43.62	2.3127	27 22 4.3	3.427
14	18 35 2.24	2.3078	27 18 34.5	3.567
15	18 37 20.56	2.3029	27 14 56.3	3.706
16	18 39 38.59	2.2980	27 11 9.8	3.843
17	18 41 56.32	2.2931	27 7 15.2	3.978
18	18 44 13.76	2.2881	27 3 12.5	4.113
19	18 46 30.89	2.2830	26 59 1.7	4.246
20	18 48 47.72	2.2779	26 54 42.8	4.381
21	18 51 4.24	2.2728	26 50 16.0	4.513
22	18 53 20.45	2.2676	26 45 41.3	4.644
23	18 55 36.35	2.2623	26 40 58.7	4.776
24	18 57 51.93	2.2570	S. 26 36 8.2	4.906

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 13.					**MONDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 57 51.93	2.2570	S.26 36 8.2	4.906	0	20 39 50.72	1.9945	S.20 30 28.2	9.949
1	19 0 7.19	2.2517	26 31 10.0	5.034	1	20 41 50.24	1.9895	20 20 28.8	10.031
2	19 2 22.13	2.2464	26 26 4.2	5.161	2	20 43 49.46	1.9846	20 10 24.5	10.112
3	19 4 36.76	2.2411	26 20 50.7	5.288	3	20 45 48.39	1.9797	20 0 15.4	10.191
4	19 6 51.06	2.2356	26 15 29.6	5.413	4	20 47 47.02	1.9748	19 50 1.6	10.269
5	19 9 5.03	2.2302	26 10 1.1	5.538	5	20 49 45.36	1.9699	19 39 43.1	10.347
6	19 11 18.68	2.2247	26 4 25.1	5.662	6	20 51 43.41	1.9651	19 29 20.0	10.423
7	19 13 32.00	2.2192	25 58 41.7	5.784	7	20 53 41.17	1.9603	19 18 52.3	10.499
8	19 15 44.99	2.2137	25 52 51.0	5.906	8	20 55 38.65	1.9557	19 8 20.1	10.574
9	19 17 57.65	2.2082	25 46 53.0	6.027	9	20 57 35.85	1.9510	18 57 43.4	10.649
10	19 20 9.97	2.2026	25 40 47.8	6.147	10	20 59 32.77	1.9463	18 47 2.2	10.723
11	19 22 21.96	2.1971	25 34 35.4	6.265	11	21 1 29.41	1.9417	18 36 16.6	10.796
12	19 24 33.62	2.1915	25 28 16.0	6.382	12	21 3 25.78	1.9372	18 25 26.7	10.867
13	19 26 44.94	2.1858	25 21 49.6	6.499	13	21 5 21.88	1.9327	18 14 32.6	10.937
14	19 28 55.92	2.1802	25 15 16.2	6.615	14	21 7 17.71	1.9283	18 3 34.2	11.007
15	19 31 6.57	2.1747	25 8 35.8	6.730	15	21 9 13.28	1.9240	17 52 31.7	11.076
16	19 33 16.88	2.1690	25 1 48.6	6.842	16	21 11 8.59	1.9197	17 41 25.1	11.144
17	19 35 26.85	2.1634	24 54 54.7	6.954	17	21 13 3.64	1.9154	17 30 14.4	11.212
18	19 37 36.49	2.1578	24 47 54.1	7.066	18	21 14 58.44	1.9112	17 18 59.7	11.278
19	19 39 45.79	2.1521	24 40 46.8	7.177	19	21 16 52.99	1.9071	17 7 41.1	11.343
20	19 41 54.75	2.1464	24 33 32.9	7.286	20	21 18 47.29	1.9029	16 56 18.5	11.409
21	19 44 3.36	2.1408	24 26 12.5	7.394	21	21 20 41.34	1.8988	16 44 52.0	11.473
22	19 46 11.64	2.1352	24 18 45.6	7.502	22	21 22 35.15	1.8949	16 33 21.7	11.537
23	19 48 19.58	2.1295	S.24 11 12.3	7.608	23	21 24 28.73	1.8910	S.16 21 47.6	11.599
	SUNDAY 14.					**TUESDAY 16.**			
0	19 50 27.18	2.1238	S.24 3 32.6	7.714	0	21 26 22.07	1.8871	S.16 10 9.8	11.661
1	19 52 34.44	2.1182	23 55 46.6	7.818	1	21 28 15.18	1.8833	15 58 28.3	11.722
2	19 54 41.37	2.1127	23 47 54.4	7.921	2	21 30 8.06	1.8795	15 46 43.2	11.781
3	19 56 47.96	2.1071	23 39 56.1	8.023	3	21 32 0.72	1.8758	15 34 54.6	11.840
4	19 58 54.22	2.1015	23 31 51.6	8.126	4	21 33 53.15	1.8721	15 23 2.4	11.899
5	20 1 0.14	2.0959	23 23 41.0	8.227	5	21 35 45.37	1.8685	15 11 6.7	11.957
6	20 3 5.73	2.0904	23 15 24.4	8.326	6	21 37 37.37	1.8649	14 59 7.6	12.013
7	20 5 10.99	2.0848	23 7 1.9	8.423	7	21 39 29.16	1.8614	14 47 5.1	12.069
8	20 7 15.91	2.0792	22 58 33.6	8.520	8	21 41 20.74	1.8580	14 34 59.3	12.125
9	20 9 20.50	2.0737	22 49 59.5	8.617	9	21 43 12.12	1.8547	14 22 50.1	12.180
10	20 11 24.76	2.0682	22 41 19.6	8.713	10	21 45 3.30	1.8514	14 10 37.7	12.234
11	20 13 28.69	2.0628	22 32 33.9	8.808	11	21 46 54.29	1.8481	13 58 22.1	12.287
12	20 15 32.30	2.0575	22 23 42.6	8.901	12	21 48 45.08	1.8449	13 46 3.3	12.339
13	20 17 35.59	2.0521	22 14 45.8	8.993	13	21 50 35.68	1.8418	13 33 41.4	12.390
14	20 19 38.55	2.0466	22 5 43.4	9.086	14	21 52 26.10	1.8388	13 21 16.5	12.441
15	20 21 41.18	2.0412	21 56 35.5	9.177	15	21 54 16.34	1.8358	13 8 48.5	12.492
16	20 23 43.49	2.0359	21 47 22.2	9.266	16	21 56 6.40	1.8328	12 56 17.5	12.541
17	20 25 45.49	2.0306	21 38 3.6	9.354	17	21 57 56.28	1.8299	12 43 43.6	12.589
18	20 27 47.17	2.0253	21 28 39.7	9.442	18	21 59 45.99	1.8272	12 31 6.8	12.637
19	20 29 48.53	2.0201	21 19 10.5	9.529	19	22 1 35.54	1.8245	12 18 27.1	12.684
20	20 31 49.58	2.0150	21 9 36.2	9.614	20	22 3 24.93	1.8218	12 5 44.7	12.730
21	20 33 50.33	2.0099	20 59 56.8	9.699	21	22 5 14.15	1.8191	11 52 59.5	12.776
22	20 35 50.77	2.0047	20 50 12.3	9.784	22	22 7 3.22	1.8166	11 40 11.6	12.821
23	20 37 50.90	1.9996	20 40 22.7	9.867	23	22 8 52.14	1.8142	11 27 21.0	12.865
24	20 39 50.72	1.9945	S.20 30 28.2	9.949	24	22 10 40.92	1.8118	S.11 14 27.8	12.908

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 10 40.92	1.8118	S. 11 14 27.8	12.908	0	23 36 7.09	1.7743	S. 0 18 27.1	14.149
1	22 12 29.56	1.8094	11 1 32.0	12.951	1	23 37 53.57	1.7752	S. 0 4 17.9	14.157
2	22 14 18.05	1.8070	10 48 33.6	12.994	2	23 39 40.11	1.7762	N. 0 9 51.8	14.164
3	22 16 6.40	1.8048	10 35 32.7	13.035	3	23 41 26.72	1.7773	0 24 1.8	14.170
4	22 17 54.62	1.8027	10 22 29.4	13.074	4	23 43 13.39	1.7784	0 38 12.2	14.176
5	22 19 42.72	1.8006	10 9 23.8	13.113	5	23 45 0.13	1.7796	0 52 22.9	14.181
6	22 21 30.69	1.7985	9 56 15.8	13.153	6	23 46 46.94	1.7808	1 6 33.9	14.185
7	22 23 18.54	1.7966	9 43 5.4	13.192	7	23 48 33.83	1.7822	1 20 45.1	14.188
8	22 25 6.28	1.7947	9 29 52.8	13.229	8	23 50 20.80	1.7836	1 34 56.5	14.191
9	22 26 53.90	1.7928	9 16 37.9	13.266	9	23 52 7.86	1.7851	1 49 8.0	14.192
10	22 28 41.41	1.7910	9 3 20.8	13.302	10	23 53 55.01	1.7866	2 3 19.6	14.193
11	22 30 28.82	1.7894	8 50 1.6	13.338	11	23 55 42.25	1.7882	2 17 31.2	14.193
12	22 32 16.14	1.7878	8 36 40.2	13.373	12	23 57 29.59	1.7899	2 31 42.8	14.192
13	22 34 3.36	1.7862	8 23 16.8	13.407	13	23 59 17.04	1.7916	2 45 54.3	14.191
14	22 35 50.49	1.7847	8 9 51.4	13.440	14	0 1 4.59	1.7934	3 0 5.7	14.188
15	22 37 37.52	1.7832	7 56 24.0	13.473	15	0 2 52.25	1.7953	3 14 16.9	14.185
16	22 39 24.47	1.7818	7 42 54.6	13.506	16	0 4 40.03	1.7973	3 28 27.9	14.181
17	22 41 11.34	1.7806	7 29 23.3	13.537	17	0 6 27.93	1.7993	3 42 38.6	14.176
18	22 42 58.14	1.7794	7 15 50.2	13.567	18	0 8 15.95	1.8014	3 56 49.0	14.170
19	22 44 44.86	1.7782	7 2 15.3	13.597	19	0 10 4.10	1.8036	4 10 59.0	14.163
20	22 46 31.52	1.7771	6 48 38.6	13.626	20	0 11 52.39	1.8059	4 25 8.6	14.156
21	22 48 18.11	1.7760	6 35 0.2	13.654	21	0 13 40.81	1.8082	4 39 17.7	14.147
22	22 50 4.64	1.7751	6 21 20.1	13.682	22	0 15 29.37	1.8106	4 53 26.3	14.138
23	22 51 51.12	1.7742	S. 6 7 38.3	13.710	23	0 17 18.08	1.8130	N. 5 7 34.3	14.127
	THURSDAY 18.					SATURDAY 20.			
0	22 53 37.55	1.7734	S. 5 53 54.9	13.737	0	0 19 6.93	1.8155	N. 5 21 41.6	14.116
1	22 55 23.93	1.7727	5 40 9.9	13.762	1	0 20 55.94	1.8181	5 35 48.2	14.104
2	22 57 10.27	1.7720	5 26 23.5	13.786	2	0 22 45.11	1.8207	5 49 54.1	14.092
3	22 58 56.57	1.7713	5 12 35.6	13.810	3	0 24 34.43	1.8234	6 3 59.3	14.079
4	23 0 42.83	1.7707	4 58 46.3	13.833	4	0 26 23.92	1.8263	6 18 3.6	14.064
5	23 2 29.06	1.7702	4 44 55.6	13.856	5	0 28 13.59	1.8292	6 32 7.0	14.048
6	23 4 15.26	1.7699	4 31 3.6	13.878	6	0 30 3.43	1.8322	6 46 9.4	14.032
7	23 6 1.44	1.7696	4 17 10.3	13.899	7	0 31 53.45	1.8352	7 0 10.8	14.014
8	23 7 47.61	1.7693	4 3 15.7	13.920	8	0 33 43.65	1.8382	7 14 11.1	13.996
9	23 9 33.76	1.7691	3 49 19.9	13.940	9	0 35 34.04	1.8414	7 28 10.3	13.977
10	23 11 19.90	1.7689	3 35 22.9	13.959	10	0 37 24.62	1.8447	7 42 8.3	13.957
11	23 13 6.03	1.7688	3 21 24.8	13.977	11	0 39 15.40	1.8479	7 56 5.1	13.936
12	23 14 52.16	1.7688	3 7 25.6	13.995	12	0 41 6.37	1.8512	8 10 0.6	13.913
13	23 16 38.29	1.7689	2 53 25.4	14.012	13	0 42 57.55	1.8547	8 23 54.7	13.890
14	23 18 24.43	1.7691	2 39 24.2	14.028	14	0 44 48.94	1.8582	8 37 47.4	13.867
15	23 20 10.58	1.7693	2 25 22.0	14.044	15	0 46 40.53	1.8617	8 51 38.7	13.842
16	23 21 56.75	1.7696	2 11 18.9	14.058	16	0 48 32.34	1.8654	9 5 28.4	13.815
17	23 23 42.93	1.7698	1 57 15.0	14.072	17	0 50 24.38	1.8692	9 19 16.5	13.787
18	23 25 29.13	1.7702	1 43 10.3	14.085	18	0 52 16.64	1.8729	9 33 2.9	13.759
19	23 27 15.36	1.7708	1 29 4.8	14.098	19	0 54 9.13	1.8767	9 46 47.6	13.731
20	23 29 1.63	1.7714	1 14 58.5	14.111	20	0 56 1.85	1.8806	10 0 30.6	13.701
21	23 30 47.93	1.7720	1 0 51.5	14.122	21	0 57 54.80	1.8845	10 14 11.7	13.669
22	23 32 34.27	1.7727	0 46 43.9	14.131	22	0 59 47.99	1.8886	10 27 50.9	13.637
23	23 34 20.66	1.7735	0 32 35.8	14.140	23	1 1 41.43	1.8927	10 41 28.1	13.603
24	23 36 7.09	1.7743	S. 0 18 27.1	14.149	24	1 3 35.11	1.8968	N. 10 55 3.3	13.569

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
	h	m	s	s	°	′	″	″
0	1	3	35.11	1.8968	N.10	55	3.3	13.569
1	1	5	29.04	1.9010	11	8	36.4	13.534
2	1	7	23.23	1.9054	11	22	7.4	13.497
3	1	9	17.69	1.9098	11	35	36.1	13.459
4	1	11	12.41	1.9142	11	49	2.5	13.421
5	1	13	7.40	1.9187	12	2	26.6	13.382
6	1	15	2.65	1.9232	12	15	48.3	13.341
7	1	16	58.18	1.9278	12	29	7.5	13.299
8	1	18	53.99	1.9325	12	42	24.2	13.256
9	1	20	50.08	1.9373	12	55	38.2	13.211
10	1	22	46.46	1.9421	13	8	49.5	13.166
11	1	24	43.13	1.9469	13	21	58.1	13.120
12	1	26	40.09	1.9518	13	35	3.9	13.072
13	1	28	37.34	1.9568	13	48	6.8	13.023
14	1	30	34.90	1.9619	14	1	6.7	12.973
15	1	32	32.77	1.9671	14	14	3.6	12.922
16	1	34	30.95	1.9722	14	26	57.4	12.870
17	1	36	29.43	1.9773	14	39	48.0	12.816
18	1	38	28.22	1.9825	14	52	35.3	12.761
19	1	40	27.33	1.9879	15	5	19.3	12.705
20	1	42	26.77	1.9933	15	17	59.9	12.648
21	1	44	26.53	1.9987	15	30	37.1	12.590
22	1	46	26.62	2.0042	15	43	10.7	12.530
23	1	48	27.04	2.0097	N.15	55	40.7	12.470

MONDAY 22.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
0	1	50	27.79	2.0153	N.16	8	7.1	12.408
1	1	52	28.88	2.0210	16	20	29.7	12.344
2	1	54	30.31	2.0267	16	32	48.4	12.279
3	1	56	32.08	2.0324	16	45	3.2	12.213
4	1	58	34.20	2.0382	16	57	14.0	12.147
5	2	0	36.67	2.0441	17	9	20.8	12.078
6	2	2	39.49	2.0500	17	21	23.4	12.008
7	2	4	42.67	2.0559	17	33	21.8	11.937
8	2	6	46.20	2.0618	17	45	15.9	11.865
9	2	8	50.09	2.0679	17	57	5.6	11.792
10	2	10	54.35	2.0740	18	8	50.9	11.717
11	2	12	58.97	2.0800	18	20	31.6	11.640
12	2	15	3.95	2.0861	18	32	7.7	11.562
13	2	17	9.30	2.0923	18	43	39.1	11.484
14	2	19	15.03	2.0986	18	55	5.8	11.404
15	2	21	21.13	2.1048	19	6	27.6	11.322
16	2	23	27.60	2.1110	19	17	44.5	11.239
17	2	25	34.45	2.1173	19	28	56.3	11.154
18	2	27	41.68	2.1237	19	40	3.0	11.068
19	2	29	49.29	2.1300	19	51	4.5	10.982
20	2	31	57.28	2.1364	20	2	0.8	10.894
21	2	34	5.66	2.1429	20	12	51.8	10.804
22	2	36	14.43	2.1493	20	23	37.3	10.712
23	2	38	23.58	2.1557	20	34	17.3	10.620
24	2	40	33.12	2.1622	N.20	44	51.7	10.527

TUESDAY 23.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
	h	m	s	s	°	′	″	″
0	2	40	33.12	2.1622	N.20	44	51.7	10.527
1	2	42	43.05	2.1687	20	55	20.5	10.432
2	2	44	53.37	2.1752	21	5	43.5	10.334
3	2	47	4.08	2.1817	21	16	0.6	10.236
4	2	49	15.18	2.1883	21	26	11.8	10.137
5	2	51	26.68	2.1949	21	36	17.0	10.036
6	2	53	38.57	2.2014	21	46	16.1	9.933
7	2	55	50.85	2.2080	21	56	9.0	9.830
8	2	58	3.53	2.2146	22	5	55.7	9.725
9	3	0	16.60	2.2212	22	15	36.0	9.618
10	3	2	30.07	2.2277	22	25	9.9	9.511
11	3	4	43.93	2.2343	22	34	37.3	9.402
12	3	6	58.19	2.2409	22	43	58.1	9.291
13	3	9	12.84	2.2474	22	53	12.2	9.179
14	3	11	27.88	2.2540	23	2	19.6	9.066
15	3	13	43.32	2.2606	23	11	20.1	8.951
16	3	15	59.15	2.2671	23	20	13.7	8.834
17	3	18	15.37	2.2736	23	29	0.2	8.716
18	3	20	31.98	2.2801	23	37	39.6	8.597
19	3	22	48.98	2.2866	23	46	11.8	8.477
20	3	25	6.37	2.2930	23	54	36.8	8.356
21	3	27	24.14	2.2994	24	2	54.5	8.233
22	3	29	42.30	2.3058	24	11	4.8	8.108
23	3	32	0.84	2.3123	N.24	19	7.5	7.982

WEDNESDAY 24.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
0	3	34	19.77	2.3187	N.24	27	2.6	7.855
1	3	36	39.08	2.3249	24	34	50.1	7.727
2	3	38	58.76	2.3311	24	42	29.8	7.596
3	3	41	18.81	2.3373	24	50	1.6	7.464
4	3	43	39.24	2.3436	24	57	25.5	7.332
5	3	46	0.04	2.3497	25	4	41.5	7.199
6	3	48	21.20	2.3558	25	11	49.4	7.064
7	3	50	42.73	2.3618	25	18	49.2	6.927
8	3	53	4.62	2.3678	25	25	40.7	6.789
9	3	55	26.87	2.3737	25	32	23.9	6.650
10	3	57	49.47	2.3796	25	38	58.7	6.510
11	4	0	12.42	2.3854	25	45	25.1	6.369
12	4	2	35.72	2.3912	25	51	43.0	6.227
13	4	4	59.36	2.3968	25	57	52.3	6.083
14	4	7	23.34	2.4025	26	3	52.9	5.937
15	4	9	47.66	2.4081	26	9	44.7	5.790
16	4	12	12.31	2.4135	26	15	27.7	5.643
17	4	14	37.28	2.4188	26	21	1.9	5.495
18	4	17	2.56	2.4240	26	26	27.1	5.345
19	4	19	28.16	2.4293	26	31	43.3	5.194
20	4	21	54.08	2.4345	26	36	50.4	5.043
21	4	24	20.30	2.4395	26	41	48.4	4.890
22	4	26	46.82	2.4445	26	46	37.2	4.735
23	4	29	13.64	2.4494	26	51	16.6	4.579
24	4	31	40.75	2.4542	N.26	55	46.7	4.423

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 31 40.75	2.4542	N.26 55 46.7	4.423
1	4 34 8.14	2.4588	27 0 7.4	4.267
2	4 36 35.81	2.4634	27 4 18.7	4.108
3	4 39 3.75	2.4679	27 8 20.4	3.948
4	4 41 31.96	2.4723	27 12 12.5	3.788
5	4 44 0.43	2.4765	27 15 55.0	3.628
6	4 46 29.14	2.4806	27 19 27.9	3.467
7	4 48 58.10	2.4847	27 22 51.0	3.303
8	4 51 27.30	2.4887	27 26 4.3	3.139
9	4 53 56.74	2.4925	27 29 7.7	2.974
10	4 56 26.40	2.4962	27 32 1.2	2.809
11	4 58 56.28	2.4998	27 34 44.8	2.643
12	5 1 26.37	2.5033	27 37 18.4	2.476
13	5 3 56.67	2.5066	27 39 41.9	2.309
14	5 6 27.16	2.5097	27 41 55.4	2.141
15	5 8 57.84	2.5128	27 43 58.8	1.972
16	5 11 28.70	2.5158	27 45 52.0	1.802
17	5 13 59.74	2.5187	27 47 35.0	1.631
18	5 16 30.95	2.5215	27 49 7.7	1.460
19	5 19 2.32	2.5241	27 50 30.2	1.289
20	5 21 33.84	2.5264	27 51 42.4	1.117
21	5 24 5.49	2.5287	27 52 44.2	0.944
22	5 26 37.28	2.5309	27 53 35.7	0.772
23	5 29 9.20	2.5330	N.27 54 16.8	0.598

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 31 41.24	2.5349	N.27 54 47.5	0.424
1	5 34 13.39	2.5367	27 55 7.7	0.250
2	5 36 45.64	2.5383	27 55 17.5	+0.076
3	5 39 17.98	2.5398	27 55 16.8	−0.099
4	5 41 50.41	2.5412	27 55 5.6	0.274
5	5 44 22.92	2.5424	27 54 43.9	0.450
6	5 46 55.50	2.5435	27 54 11.6	0.626
7	5 49 28.14	2.5444	27 53 28.8	0.802
8	5 52 0.83	2.5452	27 52 35.4	0.977
9	5 54 33.56	2.5458	27 51 31.5	1.153
10	5 57 6.33	2.5464	27 50 17.0	1.330
11	5 59 39.13	2.5469	27 48 51.9	1.506
12	6 2 11.96	2.5472	27 47 16.3	1.682
13	6 4 44.80	2.5472	27 45 30.0	1.859
14	6 7 17.63	2.5471	27 43 33.2	2.035
15	6 9 50.45	2.5469	27 41 25.8	2.212
16	6 12 23.26	2.5467	27 39 7.8	2.387
17	6 14 56.06	2.5464	27 36 39.3	2.563
18	6 17 28.83	2.5458	27 34 0.2	2.740
19	6 20 1.56	2.5451	27 31 10.5	2.916
20	6 22 34.24	2.5442	27 28 10.3	3.091
21	6 25 6.87	2.5433	27 24 59.6	3.266
22	6 27 39.41	2.5422	27 21 38.4	3.441
23	6 30 11.94	2.5411	27 18 6.7	3.616
24	6 32 44.37	2.5398	N.27 14 24.5	3.790

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 32 44.37	2.5398	N.27 14 24.5	3.790
1	6 35 16.71	2.5383	27 10 31.9	3.964
2	6 37 48.96	2.5368	27 6 28.8	4.138
3	6 40 21.12	2.5351	27 2 15.3	4.312
4	6 42 53.17	2.5332	26 57 51.4	4.484
5	6 45 25.10	2.5312	26 53 17.2	4.656
6	6 47 56.91	2.5292	26 48 32.7	4.827
7	6 50 28.60	2.5270	26 43 37.9	4.999
8	6 53 0.15	2.5247	26 38 32.8	5.170
9	6 55 31.56	2.5223	26 33 17.5	5.340
10	6 58 2.82	2.5198	26 27 52.0	5.509
11	7 0 33.93	2.5172	26 22 16.4	5.678
12	7 3 4.88	2.5144	26 16 30.6	5.847
13	7 5 35.66	2.5116	26 10 34.8	6.014
14	7 8 6.27	2.5087	26 4 29.0	6.181
15	7 10 36.71	2.5057	25 58 13.1	6.347
16	7 13 6.96	2.5026	25 51 47.3	6.512
17	7 15 37.02	2.4994	25 45 11.6	6.677
18	7 18 6.89	2.4962	25 38 26.1	6.840
19	7 20 36.56	2.4928	25 31 30.8	7.003
20	7 23 6.02	2.4893	25 24 25.8	7.165
21	7 25 35.27	2.4857	25 17 11.0	7.327
22	7 28 4.30	2.4821	25 9 46.6	7.486
23	7 30 33.12	2.4785	N.25 2 12.7	7.644

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 33 1.72	2.4747	N.24 54 29.3	7.802
1	7 35 30.09	2.4708	24 46 36.4	7.960
2	7 37 58.22	2.4669	24 38 34.1	8.117
3	7 40 26.12	2.4630	24 30 22.4	8.272
4	7 42 53.78	2.4590	24 22 1.4	8.426
5	7 45 21.20	2.4549	24 13 31.3	8.579
6	7 47 48.37	2.4508	24 4 52.0	8.731
7	7 50 15.29	2.4466	23 56 3.6	8.882
8	7 52 41.96	2.4423	23 47 6.2	9.032
9	7 55 8.37	2.4380	23 37 59.8	9.181
10	7 57 34.52	2.4337	23 28 44.5	9.328
11	8 0 0.41	2.4293	23 19 20.4	9.474
12	8 2 26.03	2.4248	23 9 47.6	9.619
13	8 4 51.39	2.4204	23 0 6.1	9.764
14	8 7 16.48	2.4159	22 50 15.9	9.907
15	8 9 41.30	2.4114	22 40 17.2	10.048
16	8 12 5.85	2.4069	22 30 10.1	10.188
17	8 14 30.13	2.4023	22 19 54.6	10.328
18	8 16 54.13	2.3977	22 9 30.7	10.467
19	8 19 17.85	2.3931	21 58 58.6	10.603
20	8 21 41.30	2.3885	21 48 18.3	10.738
21	8 24 4.47	2.3838	21 37 30.0	10.872
22	8 26 27.36	2.3792	21 26 33.7	11.005
23	8 28 49.97	2.3745	21 15 29.4	11.136
24	8 31 12.30	2.3698	N.21 4 17.3	11.267

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 31 12.30	2.3698	N.21 4 17.3	11.267
1	8 33 34.35	2.3651	20 52 57.4	11.396
2	8 35 56.12	2.3604	20 41 29.8	11.523
3	8 38 17.60	2.3557	20 29 54.6	11.649
4	8 40 38.80	2.3510	20 18 11.9	11.774
5	8 42 59.72	2.3463	20 6 21.7	11.897
6	8 45 20.36	2.3417	19 54 24.2	12.019
7	8 47 40.72	2.3370	19 42 19.4	12.140
8	8 50 0.80	2.3323	19 30 7.4	12.260
9	8 52 20.60	2.3277	19 17 48.2	12.378
10	8 54 40.12	2.3231	19 5 22.0	12.494
11	8 56 59.37	2.3185	18 52 48.9	12.608
12	8 59 18.34	2.3139	18 40 9.0	12.722
13	9 1 37.04	2.3093	18 27 22.3	12.834
14	9 3 55.46	2.3047	18 14 28.9	12.946
15	9 6 13.61	2.3002	18 1 28.8	13.056
16	9 8 31.49	2.2958	17 48 22.2	13.163
17	9 10 49.11	2.2914	17 35 9.2	13.269
18	9 13 6.46	2.2870	17 21 49.9	13.374
19	9 15 23.55	2.2826	17 8 24.3	13.477
20	9 17 40.37	2.2782	16 54 52.6	13.579
21	9 19 56.93	2.2738	16 41 14.8	13.680
22	9 22 13.23	2.2696	16 27 31.0	13.779
23	9 24 29.28	2.2654	N.16 13 41.3	13.877

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 26 45.08	2.2612	N.15 59 45.8	13.973
1	9 29 0.63	2.2571	15 45 44.6	14.068
2	9 31 15.93	2.2530	15 31 37.7	14.161
3	9 33 30.99	2.2490	15 17 25.3	14.252
4	9 35 45.81	2.2450	15 3 7.4	14.342
5	9 38 0.39	2.2410	14 48 44.2	14.431
6	9 40 14.73	2.2371	14 34 15.7	14.518
7	9 42 28.84	2.2333	14 19 42.0	14.604
8	9 44 42.72	2.2295	14 5 3.2	14.688
9	9 46 56.38	2.2258	13 50 19.4	14.771
10	9 49 9.81	2.2221	13 35 30.7	14.852
11	9 51 23.03	2.2185	13 20 37.2	14.932
12	9 53 36.03	2.2149	13 5 38.9	15.010
13	9 55 48.82	2.2114	12 50 36.0	15.087
14	9 58 1.40	2.2080	12 35 28.5	15.162
15	10 0 13.78	2.2047	12 20 16.6	15.235
16	10 2 25.96	2.2014	12 5 0.3	15.307
17	10 4 37.95	2.1982	11 49 39.8	15.377
18	10 6 49.74	2.1950	11 34 15.1	15.446
19	10 9 1.35	2.1919	11 18 46.3	15.513
20	10 11 12.77	2.1888	11 3 13.5	15.579
21	10 13 24.01	2.1858	10 47 36.8	15.643
22	10 15 35.08	2.1830	10 31 56.3	15.707
23	10 17 45.97	2.1801	10 16 12.0	15.768
24	10 19 56.69	2.1773	N.10 0 24.1	15.827

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 19 56.69	2.1773	N.10 0 24.1	15.827
1	10 22 7.25	2.1747	9 44 32.7	15.886
2	10 24 17.66	2.1722	9 28 37.8	15.942
3	10 26 27.91	2.1696	9 12 39.6	15.997
4	10 28 38.01	2.1672	8 56 38.2	16.050
5	10 30 47.97	2.1649	8 40 33.6	16.102
6	10 32 57.79	2.1626	8 24 25.9	16.153
7	10 35 7.48	2.1603	8 8 15.2	16.202
8	10 37 17.03	2.1581	7 52 1.7	16.248
9	10 39 26.45	2.1560	7 35 45.4	16.294
10	10 41 35.75	2.1541	7 19 26.4	16.338
11	10 43 44.94	2.1522	7 3 4.8	16.381
12	10 45 54.02	2.1504	6 46 40.7	16.422
13	10 48 2.99	2.1487	6 30 14.2	16.461
14	10 50 11.86	2.1469	6 13 45.4	16.499
15	10 52 20.62	2.1453	5 57 14.3	16.536
16	10 54 29.29	2.1438	5 40 41.1	16.570
17	10 56 37.88	2.1424	5 24 5.9	16.602
18	10 58 46.38	2.1410	5 7 28.8	16.634
19	11 0 54.80	2.1397	4 50 49.8	16.664
20	11 3 3.15	2.1386	4 34 9.1	16.692
21	11 5 11.43	2.1375	4 17 26.7	16.719
22	11 7 19.65	2.1365	4 0 42.8	16.744
23	11 9 27.81	2.1355	N. 3 43 57.4	16.768

THURSDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 11 35.91	2.1346	N. 3 27 10.6	16.790

PHASES OF THE MOON.

	d	h	m
● New Moon, . .	6	9	58.2
☽ First Quarter, . .	13	15	42.1
○ Full Moon, . . .	21	19	30.7
☾ Last Quarter, . .	29	2	21.6

	d	h
☾ Perigee, ...	4	16.7
☾ Apogee, ...	16	15.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
1	Aldebaran	W.	47° 2′ 25″	2433	48° 45′ 12″	2414	50° 28′ 27″	2395	52° 12′ 9″	2377
	Sun	E.	74 1 46	2615	72 23 11	2603	70 44 19	2590	69 5 10	2577
2	Aldebaran	W.	60 56 46	2298	62 42 48	2285	64 29 10	2271	66 15 52	2259
	Pollux	W.	17 41 54	2276	19 28 29	2253	21 15 38	2233	23 3 16	2215
	Sun	E.	60 45 8	2517	59 4 19	2506	57 23 14	2495	55 41 54	2485
3	Aldebaran	W.	75 13 42	2205	77 2 2	2196	78 50 36	2188	80 39 22	2180
	Pollux	W.	32 7 12	2151	33 56 54	2141	35 46 51	2131	37 37 3	2123
	Sun	E.	47 11 53	2441	45 29 17	2433	43 46 30	2427	42 3 34	2422
4	Pollux	W.	46 50 52	2091	48 42 5	2087	50 33 24	2083	52 24 49	2081
	Sun	E.	33 27 8	2403	31 43 38	2402	30 0 6	2403	28 16 35	2405
8	Sun	W.	21 56 27	2643	23 34 24	2653	25 12 7	2664	26 49 35	2676
	Jupiter	E.	50 42 9	2341	48 57 9	2357	47 12 33	2375	45 28 22	2392
	α Aquilæ	E.	86 29 1	2987	84 58 32	3006	83 28 27	3027	81 58 48	3049
9	Sun	W.	34 52 19	2753	36 27 49	2769	38 2 57	2787	39 37 42	2805
	Jupiter	E.	36 54 3	2489	35 12 35	2510	33 31 36	2533	31 51 8	2555
	α Aquilæ	E.	74 37 56	3183	73 11 27	3214	71 45 35	3247	70 20 22	3283
10	Sun	W.	47 25 33	2897	48 57 56	2915	50 29 56	2934	52 1 32	2953
	α Aquilæ	E.	63 25 13	3488	62 4 35	3535	60 44 49	3585	59 25 58	3637
	Fomalhaut	E.	85 57 57	2853	84 24 38	2872	82 51 43	2892	81 19 14	2912
	Mars	E.	93 48 4	2583	92 8 46	2602	90 29 54	2621	88 51 27	2639
11	Sun	W.	59 33 40	3045	61 2 57	3063	62 31 52	3081	64 0 25	3098
	Venus	W.	19 49 26	3178	21 16 1	3188	22 42 25	3198	24 8 36	3209
	α Aquilæ	E.	53 6 52	3950	51 54 23	4026	50 43 9	4105	49 33 12	4191
	Fomalhaut	E.	73 43 29	3022	72 13 43	3044	70 44 25	3068	69 15 36	3091
	Mars	E.	80 45 20	2729	79 9 18	2747	77 33 40	2763	75 58 24	2781
	Saturn	E.	86 49 42	2675	85 12 29	2693	83 35 40	2710	81 59 13	2725
	α Pegasi	E.	95 28 7	2893	93 55 39	2909	92 23 32	2925	90 51 45	2942
12	Sun	W.	71 17 57	3183	72 44 27	3198	74 10 39	3214	75 36 32	3228
	Venus	W.	31 15 50	3276	32 40 29	3290	34 4 52	3304	35 28 59	3317
	Antares	W.	22 22 53	2815	23 57 1	2830	25 30 50	2845	27 4 20	2858
	Fomalhaut	E.	61 58 57	3219	60 33 10	3246	59 7 55	3275	57 43 14	3303
	Mars	E.	68 7 36	2862	66 34 29	2878	65 1 42	2893	63 29 14	2909
	Saturn	E.	74 2 14	2804	72 27 51	2819	70 53 48	2833	69 20 3	2847
	α Pegasi	E.	83 17 57	3022	81 48 12	3039	80 18 48	3056	78 49 44	3071
13	Sun	W.	82 41 42	3298	84 5 56	3310	85 29 56	3323	86 53 41	3334
	Venus	W.	42 25 47	3380	43 48 26	3393	45 10 51	3404	46 33 3	3415
	Antares	W.	34 47 37	2921	36 19 29	2933	37 51 6	2944	39 22 29	2954
	Jupiter	W.	15 23 42	3162	16 50 37	3143	18 17 54	3131	19 45 26	3124
	Fomalhaut	E.	50 48 34	3466	49 27 32	3503	48 7 11	3542	46 47 33	3583
	Mars	E.	55 51 32	2977	54 20 51	2990	52 50 26	3002	51 20 16	3015
	Saturn	E.	61 35 41	2912	60 3 37	2924	58 31 49	2936	57 0 16	2946
	α Pegasi	E.	71 29 18	3152	70 2 11	3168	68 35 23	3183	67 8 54	3200
14	Sun	W.	93 49 17	3386	95 11 50	3394	96 34 13	3403	97 56 26	3410

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Aldebaran	W.	53° 56′ 17″	2359	55° 40′ 50″	2344	57° 25′ 46″	2328	59° 11′ 5″	2313
	Sun	E.	67 25 43	2564	65 45 59	2559	64 5 58	2540	62 25 41	2529
2	Aldebaran	W.	68 2 52	2247	69 50 10	2235	71 37 45	2225	73 25 36	2214
	Pollux	W.	24 51 21	2200	26 39 49	2186	28 28 38	2173	30 17 46	2161
	Sun	E.	54 0 20	2475	52 18 32	2466	50 36 31	2458	48 54 18	2449
3	Aldebaran	W.	82 28 19	2173	84 17 27	2167	86 6 44	2161	87 56 10	2157
	Pollux	W.	39 27 27	2115	41 18 3	2108	43 8 50	2101	44 59 47	2096
	Sun	E.	40 20 30	2416	38 37 18	2411	36 53 59	2408	35 10 35	2405
4	Pollux	W.	54 16 18	2079	56 7 50	2077	57 59 25	2076	59 51 1	2075
	Sun	E.	26 33 7	2408	24 49 43	2413	23 6 27	2420	21 23 21	2429
8	Sun	W.	28 26 47	2690	30 3 40	2704	31 40 14	2720	33 16 27	2736
	Jupiter	E.	43 44 36	2411	42 1 17	2430	40 18 25	2449	38 36 0	2469
	α Aquilæ	E.	80 29 36	3073	79 0 53	3098	77 32 41	3124	76 5 1	3153
9	Sun	W.	41 12 3	2623	42 46 1	2642	44 19 35	2659	45 52 46	2678
	Jupiter	E.	30 11 11	2579	28 31 47	2603	26 52 56	2629	25 14 41	2656
	α Aquilæ	E.	68 55 51	3330	67 32 3	3358	66 8 59	3400	64 46 42	3442
10	Sun	W.	53 32 44	2971	55 3 33	2990	56 33 58	3009	58 4 0	3028
	α Aquilæ	E.	58 8 4	3693	56 51 10	3752	55 35 18	3815	54 20 31	3881
	Fomalhaut	E.	79 47 11	2933	78 15 34	2955	76 44 25	2977	75 13 43	2999
	Mars	E.	87 13 25	2657	85 35 47	2675	83 58 34	2693	82 21 45	2711
11	Sun	W.	65 28 37	3116	66 56 27	3133	68 23 57	3149	69 51 7	3166
	Venus	W.	25 34 34	3922	27 0 17	3936	28 25 44	3949	29 50 55	3963
	α Aquilæ	E.	48 24 37	4281	47 17 27	4379	46 11 47	4484	45 7 41	4599
	Fomalhaut	E.	67 47 16	3115	66 19 25	3141	64 52 5	3166	63 25 15	3193
	Mars	E.	74 23 31	2798	72 49 0	2815	71 14 51	2831	69 41 3	2847
	Saturn	E.	80 23 7	2742	78 47 23	2757	77 11 59	2773	75 36 56	2789
	α Pegasi	E.	89 20 19	2958	87 49 13	2973	86 18 27	2990	84 48 2	3006
12	Sun	W.	77 2 8	3943	78 27 26	3957	79 52 28	3971	81 17 13	3985
	Venus	W.	36 52 51	3331	38 16 27	3344	39 39 48	3356	41 2 55	3369
	Antares	W.	28 37 33	2872	30 10 28	2884	31 43 7	2897	33 15 30	2909
	Fomalhaut	E.	56 19 6	3333	54 55 33	3365	53 32 36	3397	52 10 16	3431
	Mars	E.	61 57 6	2923	60 25 16	2937	58 53 44	2950	57 22 29	2965
	Saturn	E.	67 46 36	2861	66 13 27	2874	64 40 35	2887	63 8 0	2900
	α Pegasi	E.	77 20 59	3088	75 52 35	3104	74 24 30	3119	72 56 44	3136
13	Sun	W.	88 17 13	3345	89 40 32	3356	91 3 39	3366	92 26 34	3377
	Venus	W.	47 55 3	3425	49 16 51	3435	50 38 28	3445	51 59 54	3454
	Antares	W.	40 53 39	2965	42 24 36	2974	43 55 21	2984	45 25 54	2992
	Jupiter	W.	21 13 7	3119	22 40 53	3117	24 8 42	3117	25 36 31	3119
	Fomalhaut	E.	45 28 40	3627	44 10 35	3674	42 53 20	3725	41 36 50	3779
	Mars	E.	49 50 22	3026	48 20 42	3036	46 51 16	3048	45 22 3	3059
	Saturn	E.	55 28 56	2958	53 57 50	2967	52 26 56	2977	50 56 15	2986
	α Pegasi	E.	65 42 45	3916	64 16 55	3932	62 51 24	3949	61 26 13	3965
14	Sun	W.	99 18 31	3418	100 40 27	3424	102 2 16	3431	103 23 58	3437

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Venus	W.	53° 21′ 9″	3463	54° 42′ 15″	3471	56° 3′ 11″	3479	57° 23′ 59″	3486
	Antares	W.	46 56 17	3001	48 26 29	3009	49 56 31	3017	51 26 23	3025
	Jupiter	W.	27 4 18	3120	28 32 3	3122	29 59 46	3124	31 27 26	3127
	Fomalhaut	E.	40 21 35	3838	39 7 12	3902	37 53 54	3972	36 41 47	4049
	Mars	E.	43 53 3	3069	42 24 15	3079	40 55 40	3088	39 27 16	3098
	Saturn	E.	49 25 45	2996	47 55 27	3004	46 25 19	3013	44 55 22	3021
	α Pegasi	E.	60 1 21	3282	58 36 49	3300	57 12 37	3317	55 48 45	3335
15	Sun	W.	104 45 33	3442	106 7 2	3447	107 28 25	3451	108 49 44	3455
	Venus	W.	64 6 7	3515	65 26 14	3520	66 46 16	3524	68 6 14	3526
	Antares	W.	58 53 48	3051	60 22 58	3056	61 52 2	3059	63 21 2	3063
	Jupiter	W.	38 44 55	3142	40 12 14	3143	41 39 31	3145	43 6 46	3148
	Mars	E.	32 8 1	3141	30 40 41	3149	29 13 31	3157	27 46 30	3166
	Saturn	E.	37 27 55	3055	35 58 50	3060	34 29 52	3066	33 1 1	3071
	α Pegasi	E.	48 54 48	3434	47 33 10	3457	46 11 58	3481	44 51 13	3506
	α Arietis	E.	89 19 16	3069	87 50 29	3073	86 21 47	3078	84 53 10	3081
16	Sun	W.	115 35 22	3467	116 56 23	3469	118 17 22	3470	119 38 20	3470
	Venus	W.	74 45 21	3536	76 5 5	3536	77 24 49	3536	78 44 33	3536
	Antares	W.	70 45 10	3072	72 13 54	3073	73 42 37	3073	75 11 20	3073
	Jupiter	W.	50 22 34	3152	51 49 41	3151	53 16 49	3150	54 43 58	3150
	α Arietis	E.	77 30 56	3091	76 2 35	3091	74 34 15	3093	73 5 57	3093
17	Venus	W.	85 23 29	3527	86 43 23	3525	88 3 20	3521	89 23 21	3517
	Antares	W.	82 35 8	3065	84 4 0	3063	85 32 55	3060	87 1 54	3056
	Jupiter	W.	62 0 4	3140	63 27 25	3137	64 54 50	3133	66 22 19	3130
	α Arietis	E.	65 44 17	3088	64 15 53	3086	62 47 26	3083	61 18 56	3081
	Aldebaran	E.	97 26 27	3140	95 59 6	3138	94 31 42	3134	93 4 14	3131
18	Venus	W.	96 4 37	3493	97 25 9	3487	98 45 48	3480	100 6 34	3474
	Jupiter	W.	73 40 56	3107	75 8 57	3102	76 37 4	3096	78 5 18	3090
	α Aquilæ	W.	49 13 37	4439	50 18 23	4374	51 24 8	4313	52 30 49	4255
	α Arietis	E.	53 55 33	3064	52 26 39	3060	50 57 41	3056	49 28 38	3052
	Aldebaran	E.	85 45 44	3110	84 17 46	3105	82 49 42	3100	81 21 32	3095
19	Jupiter	W.	85 28 23	3057	86 57 25	3050	88 26 36	3043	89 55 56	3035
	α Aquilæ	W.	58 16 36	4019	59 27 57	3980	60 39 56	3943	61 52 32	3909
	α Arietis	E.	42 1 59	3030	40 32 23	3025	39 2 41	3021	37 32 54	3017
	Aldebaran	E.	73 59 6	3067	72 30 16	3061	71 1 19	3056	69 32 15	3049
20	Jupiter	W.	97 24 56	2996	98 55 14	2987	100 25 43	2979	101 56 22	2970
	α Aquilæ	W.	68 3 49	3760	69 19 33	3735	70 35 43	3710	71 52 19	3688
	Fomalhaut	W.	41 25 4	3674	42 42 19	3623	44 0 28	3576	45 19 28	3533
	Mars	W.	27 13 24	3042	28 42 45	3030	30 12 21	3018	31 42 12	3006
	Saturn	W.	22 51 27	2959	24 22 31	2945	25 53 53	2932	27 25 31	2920
	Aldebaran	E.	62 5 4	3021	60 35 17	3015	59 5 23	3010	57 35 23	3005
21	α Aquilæ	W.	78 20 59	3590	79 39 44	3575	80 58 46	3559	82 18 5	3545
	Fomalhaut	W.	52 5 25	3358	53 28 30	3329	54 52 8	3302	56 16 17	3276
	Mars	W.	39 14 54	2952	40 46 7	2942	42 17 32	2932	43 49 10	2923
	Saturn	W.	35 7 29	2863	36 40 35	2853	38 13 54	2843	39 47 26	2833
	α Pegasi	W.	30 38 45	3738	31 54 52	3655	33 12 27	3581	34 31 22	3515
	Aldebaran	E.	50 3 54	2985	48 33 22	2981	47 2 46	2980	45 32 8	2978

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Venus	W.	58° 44′ 39″	3493	60° 5′ 11″	3499	61° 25′ 36″	3505	62° 45′ 55″	3511
	Antares	W.	52 56 7	3030	54 25 43	3036	55 55 11	3041	57 24 33	3047
	Jupiter	W.	32 55 3	3130	34 22 36	3133	35 50 6	3136	37 17 32	3138
	Fomalhaut	E.	35 30 56	4135	34 21 28	4229	33 13 29	4334	32 7 8	4454
	Mars	E.	37 59 4	3107	36 31 3	3115	35 3 12	3124	33 35 31	3133
	Saturn	E.	43 25 35	3028	41 55 57	3035	40 26 28	3043	38 57 8	3048
	α Pegasi	E.	54 25 14	3353	53 2 4	3372	51 39 16	3392	50 16 50	3413
15	Sun	W.	110 10 58	3459	111 32 8	3462	112 53 15	3464	114 14 19	3465
	Venus	W.	69 26 9	3530	70 46 0	3532	72 5 49	3534	73 25 36	3535
	Antares	W.	64 49 57	3065	66 18 49	3068	67 47 38	3069	69 16 25	3071
	Jupiter	W.	44 33 58	3148	46 1 9	3150	47 28 18	3151	48 55 26	3151
	Mars	E.	26 19 40	3175	24 53 1	3184	23 26 33	3195	22 0 18	3206
	Saturn	E.	31 32 16	3077	30 3 38	3082	28 35 7	3087	27 6 42	3093
	α Pegasi	E.	43 30 54	3535	42 11 10	3565	40 51 58	3598	39 33 22	3634
	α Arietis	E.	83 24 37	3083	81 56 7	3087	80 27 41	3089	78 59 18	3090
16	Sun	W.	120 59 18	3470	122 20 16	3469	123 41 15	3468	125 2 15	3467
	Venus	W.	80 4 17	3535	81 24 2	3534	82 43 49	3532	84 3 38	3530
	Antares	W.	76 40 3	3072	78 8 47	3071	79 37 32	3069	81 6 19	3068
	Jupiter	W.	56 11 7	3148	57 38 18	3147	59 5 31	3145	60 32 46	3143
	α Arietis	E.	71 37 30	3092	70 9 20	3091	68 41 0	3091	67 12 39	3090
17	Venus	W.	90 43 26	3513	92 3 36	3508	93 23 51	3504	94 44 11	3498
	Antares	W.	88 30 57	3053	90 0 4	3049	91 29 16	3045	92 58 33	3039
	Jupiter	W.	67 49 52	3126	69 17 30	3122	70 45 13	3117	72 13 2	3113
	α Arietis	E.	59 50 23	3078	58 21 46	3075	56 53 6	3072	55 24 22	3068
	Aldebaran	E.	91 36 42	3127	90 9 5	3123	88 41 23	3119	87 13 36	3114
18	Venus	W.	101 27 27	3467	102 48 28	3461	104 9 36	3454	105 30 52	3446
	Jupiter	W.	79 33 40	3084	81 2 9	3078	82 30 46	3072	83 59 30	3065
	α Aquilæ	W.	53 38 23	4202	54 46 47	4152	55 55 59	4105	57 5 56	4061
	α Arietis	E.	47 59 29	3047	46 30 15	3043	45 0 55	3039	43 31 30	3034
	Aldebaran	E.	79 53 16	3090	78 24 54	3084	76 56 25	3078	75 27 49	3073
19	Jupiter	W.	91 25 25	3028	92 55 3	3020	94 24 51	3013	95 54 48	3004
	α Aquilæ	W.	63 5 43	3875	64 19 28	3844	65 33 45	3814	66 48 33	3787
	α Arietis	E.	36 3 2	3013	34 33 5	3010	33 3 5	3007	31 33 1	3005
	Aldebaran	E.	68 3 3	3043	66 33 44	3038	65 4 18	3031	63 34 44	3026
20	Jupiter	W.	103 27 12	2962	104 58 13	2954	106 29 24	2945	108 0 46	2935
	α Aquilæ	W.	73 9 19	3666	74 26 42	3646	75 44 27	3626	77 2 33	3606
	Fomalhaut	W.	46 39 16	3493	47 59 48	3455	49 21 2	3421	50 42 55	3388
	Mars	W.	33 12 17	2995	34 42 36	2984	36 13 9	2973	37 43 55	2963
	Saturn	W.	28 57 25	2906	30 29 34	2896	32 1 58	2884	33 34 37	2874
	Aldebaran	E.	56 5 16	3000	54 35 3	2996	53 4 45	2992	51 34 22	2988
21	α Aquilæ	W.	83 37 40	3531	84 57 30	3518	86 17 34	3506	87 37 51	3497
	Fomalhaut	W.	57 40 56	3252	59 6 4	3230	60 31 38	3208	61 57 38	3187
	Mars	W.	45 21 0	2912	46 53 3	2903	48 25 18	2894	49 57 45	2883
	Saturn	W.	41 21 12	2822	42 55 11	2812	44 29 23	2802	46 3 48	2793
	α Pegasi	W.	35 51 29	3455	37 12 43	3402	38 34 57	3354	39 58 6	3309
	Aldebaran	E.	44 1 28	2978	42 30 48	2979	41 0 9	2981	39 29 32	2985

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	Pollux	E.	92° 13′ 46″	2863	90° 40′ 40″	2855	89° 7′ 23″	2845	87° 33′ 54″	2836
22	Fomalhaut	W.	63 24 3	3167	64 50 52	3148	66 18 3	3130	67 45 36	3113
	Mars	W	51 30 25	2874	53 3 17	2865	54 36 21	2855	56 9 37	2846
	Saturn	W.	47 38 25	2783	49 13 15	2773	50 48 18	2764	52 23 33	2754
	α Pegasi	W.	41 22 7	3269	42 46 55	3231	44 12 27	3197	45 38 40	3165
	Aldebaran	E.	37 59 0	2989	36 28 34	2996	34 58 16	3005	33 28 10	3016
	Pollux	E.	79 43 34	2792	78 8 55	2782	76 34 4	2774	74 59 2	2765
23	Fomalhaut	W.	75 8 16	3038	76 37 42	3025	78 7 24	3013	79 37 21	3001
	Mars	W.	63 58 56	2801	65 33 23	2792	67 8 2	2783	68 42 52	2775
	Saturn	W.	60 22 55	2708	61 59 24	2699	63 36 5	2690	65 12 58	2681
	α Pegasi	W.	52 58 32	3034	54 28 2	3013	55 57 59	2993	57 28 21	2973
	Pollux	E.	67 0 57	2722	65 24 46	2713	63 48 23	2704	62 11 49	2695
24	Fomalhaut	W.	87 10 36	2949	88 41 53	2941	90 13 20	2932	91 44 58	2925
	Mars	W.	76 39 51	2732	78 15 49	2724	79 51 57	2716	81 28 16	2707
	Saturn	W.	73 20 19	2638	74 58 22	2630	76 36 36	2622	78 15 1	2613
	α Pegasi	W.	65 5 52	2890	66 38 24	2876	68 11 14	2862	69 44 22	2848
	α Arietis	W.	21 33 26	2776	23 8 25	2750	24 43 58	2729	26 20 0	2709
	Pollux	E.	54 6 12	2655	52 28 32	2648	50 50 42	2640	49 12 42	2632
	Regulus	E.	90 56 32	2643	89 18 35	2635	87 40 27	2626	86 2 7	2618
25	Saturn	W.	86 29 57	2573	88 9 29	2565	89 49 12	2557	91 29 6	2549
	α Pegasi	W.	77 34 5	2790	79 8 46	2779	80 43 41	2769	82 18 49	2760
	α Arietis	W.	34 25 57	2634	36 4 6	2621	37 42 32	2610	39 21 14	2599
	Pollux	E.	41 0 10	2597	39 21 11	2591	37 42 3	2585	36 2 47	2578
	Regulus	E.	77 47 41	2577	76 8 14	2569	74 28 36	2561	72 48 48	2553
26	α Arietis	W.	47 38 25	2548	49 18 32	2538	50 58 53	2528	52 39 27	2520
	Aldebaran	W.	18 35 33	3300	19 59 45	3173	21 26 26	3073	22 55 9	2990
	Regulus	E.	64 27 3	2514	62 46 9	2507	61 5 5	2499	59 23 50	2491
	Sun	E.	129 18 33	2871	127 45 37	2862	126 12 30	2853	124 39 11	2844
27	α Arietis	W.	61 5 19	2477	62 47 5	2467	64 29 4	2460	66 11 14	2452
	Aldebaran	W.	30 39 46	2734	32 15 41	2701	33 52 20	2672	35 29 38	2645
	Regulus	E.	50 54 51	2453	49 12 31	2445	47 30 0	2438	45 47 19	2430
	Sun	E.	116 49 43	2801	115 15 16	2792	113 40 37	2784	112 5 48	2775
28	Aldebaran	W.	43 44 7	2543	45 24 20	2527	47 4 55	2512	48 45 52	2497
	Regulus	E.	37 11 11	2392	35 27 25	2385	33 43 29	2378	31 59 22	2370
	Sun	E.	104 8 54	2733	102 32 58	2725	100 56 52	2717	99 20 35	2709
29	Aldebaran	W.	57 15 18	2436	58 58 2	2424	60 41 2	2415	62 24 16	2405
	Sun	E.	91 16 31	2670	89 39 11	2663	88 1 41	2655	86 24 1	2648
30	Aldebaran	W.	71 3 48	2361	72 48 19	2353	74 33 2	2345	76 17 56	2338
	Pollux	W.	27 58 2	2316	29 43 38	2306	31 29 29	2296	33 15 34	2288
	Sun	E.	78 13 16	2613	76 34 39	2607	74 55 54	2601	73 17 0	2595
31	Aldebaran	W.	85 4 49	2308	86 50 37	2303	88 36 32	2298	90 22 34	2294
	Pollux	W.	42 8 50	2253	43 55 59	2247	45 43 17	2241	47 30 43	2237
	Sun	E.	65 0 33	2569	63 20 55	2564	61 41 10	2560	60 1 20	2556

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Pollux	E.	86° 0′ 13″	2828	84° 26′ 21″	2818	82° 52′ 17″	2809	81° 18′ 1″	2801
22	Fomalhaut	W.	69 13 30	3097	70 41 43	3081	72 10 16	3066	73 39 7	3052
	Mars	W.	57 43 5	2837	59 16 45	2828	60 50 37	2818	62 24 41	2810
	Saturn	W.	53 59 1	2745	55 34 41	2736	57 10 33	2726	58 46 38	2717
	α Pegasi	W.	47 5 31	3135	48 32 58	3108	50 0 58	3082	51 29 30	3057
	Aldebaran	E.	31 58 19	3033	30 28 47	3052	28 59 38	3076	27 30 59	3108
	Pollux	E.	73 23 48	2756	71 48 23	2747	70 12 46	2738	68 36 57	2730
23	Fomalhaut	W.	81 7 33	2989	82 37 59	2978	84 8 39	2969	85 39 31	2958
	Mars	W.	70 17 53	2766	71 53 6	2757	73 28 30	2749	75 4 5	2741
	Saturn	W.	66 50 3	2672	68 27 20	2664	70 4 48	2655	71 42 28	2647
	α Pegasi	W.	58 59 7	2955	60 30 16	2938	62 1 47	2921	63 33 39	2905
	Pollux	E.	60 35 3	2687	58 58 6	2680	57 20 59	2672	55 43 41	2663
24	Fomalhaut	W.	93 16 45	2917	94 48 42	2911	96 20 47	2905	97 53 0	2900
	Mars	W.	83 4 46	2702	84 41 27	2692	86 18 18	2684	87 55 20	2675
	Saturn	W.	79 53 38	2605	81 32 26	2597	83 11 25	2588	84 50 36	2581
	α Pegasi	W.	71 17 47	2835	72 51 29	2824	74 25 26	2812	75 59 38	2801
	α Arietis	W.	27 56 28	2691	29 33 20	2675	31 10 33	2660	32 48 6	2647
	Pollux	E.	47 34 31	2625	45 56 10	2618	44 17 40	2611	42 39 0	2604
	Regulus	E.	84 23 36	2610	82 44 54	2601	81 6 1	2593	79 26 57	2585
25	Saturn	W.	93 9 11	2541	94 49 27	2534	96 29 53	2526	98 10 30	2518
	α Pegasi	W.	83 54 10	2750	85 29 43	2742	87 5 27	2733	88 41 23	2725
	α Arietis	W.	41 0 11	2588	42 39 23	2577	44 18 50	2566	45 58 31	2557
	Pollux	E.	34 23 22	2572	32 43 49	2568	31 4 10	2563	29 24 24	2559
	Regulus	E.	71 8 49	2545	69 28 39	2538	67 48 18	2530	66 7 46	2522
26	α Arietis	W.	54 20 13	2511	56 1 11	2502	57 42 22	2493	59 23 45	2485
	Aldebaran	W.	24 25 34	2921	25 57 26	2864	27 30 31	2815	29 4 40	2771
	Regulus	E.	57 42 24	2483	56 0 47	2475	54 18 59	2467	52 37 0	2460
	Sun	E.	123 5 40	2835	121 31 58	2826	119 58 4	2818	118 23 59	2809
27	α Arietis	W.	67 53 35	2443	69 36 8	2436	71 18 52	2428	73 1 47	2419
	Aldebaran	W.	37 7 32	2621	38 45 58	2599	40 24 54	2579	42 4 18	2561
	Regulus	E.	44 4 27	2422	42 21 24	2415	40 38 10	2408	38 54 46	2400
	Sun	E.	110 30 47	2766	108 55 35	2758	107 20 12	2750	105 44 38	2742
28	Aldebaran	W.	50 27 9	2484	52 8 45	2471	53 50 39	2459	55 32 50	2447
	Regulus	E.	30 15 4	2363	28 30 36	2355	26 45 57	2348	25 1 8	2342
	Sun	E.	97 44 7	2701	96 7 29	2693	94 30 40	2686	92 53 41	2678
29	Aldebaran	W.	64 7 44	2396	65 51 26	2386	67 35 21	2377	69 19 29	2369
	Sun	E.	84 46 11	2640	83 8 11	2634	81 30 2	2627	79 51 44	2620
30	Aldebaran	W.	78 3 0	2331	79 48 14	2325	81 33 37	2319	83 19 9	2313
	Pollux	W.	35 1 51	2280	36 48 20	2272	38 35 0	2266	40 21 50	2259
	Sun	E.	71 37 58	2589	69 58 48	2583	68 19 30	2578	66 40 5	2573
31	Aldebaran	W.	92 8 42	2291	93 54 55	2287	95 41 13	2285	97 27 35	2282
	Pollux	W.	49 18 16	2232	51 5 56	2227	52 53 43	2224	54 41 35	2220
	Sun	E.	58 21 25	2553	56 41 26	2550	55 1 22	2548	53 21 15	2545

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S *Apparent* Right Ascension.	THE SUN'S Diff. for 1 hour.	THE SUN'S *Apparent* Declination.	THE SUN'S Diff. for 1 hour.	THE SUN'S Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be subtracted from Apparent Time.*	Diff. for 1 hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	14 27 8.13	9.812	S. 14 33 55.7	–47.91	16 9.93	66.99	16 19.85	0.043
Frid.	2	14 31 4.05	9.847	14 52 58.9	47.33	16 10.17	67.11	16 20.48	0.009
Sat.	3	14 35 0.79	9.882	15 11 47.6	46.71	16 10.41	67.22	16 20.29	0.026
Sun.	4	14 38 58.37	9.917	15 30 21.1	46.08	16 10.65	67.34	16 19.27	0.061
Mon.	5	14 42 56.79	9.952	15 48 39.4	45.43	16 10.89	67.46	16 17.42	0.096
Tues.	6	14 46 56.04	9.987	16 6 41.9	44.77	16 11.13	67.58	16 14.72	0.131
Wed.	7	14 50 56.14	10.022	16 24 28.3	44.08	16 11.37	67.70	16 11.19	0.166
Thur.	8	14 54 57.07	10.056	16 41 58.0	43.38	16 11.60	67.82	16 6.82	0.200
Frid.	9	14 58 58.84	10.091	16 59 10.6	42.66	16 11.84	67.94	16 1.63	0.235
Sat.	10	15 3 1.44	10.126	17 16 5.8	41.92	16 12.07	68.06	15 55.60	0.270
Sun.	11	15 7 4.88	10.161	17 32 43.0	41.17	16 12.30	68.18	15 48.74	0.305
Mon.	12	15 11 9.16	10.196	17 49 1.9	40.40	16 12.53	68.30	15 41.03	0.339
Tues.	13	15 15 14.28	10.231	18 5 2.4	39.61	16 12.75	68.42	15 32.48	0.374
Wed.	14	15 19 20.23	10.265	18 20 43.7	38.81	16 12.97	68.54	15 23.11	0.408
Thur.	15	15 23 27.00	10.300	18 36 5.5	37.99	16 13.19	68.66	15 12.93	0.443
Frid.	16	15 27 34.60	10.334	18 51 7.7	37.16	16 13.40	68.77	15 1.92	0.477
Sat.	17	15 31 43.03	10.367	19 5 49.6	36.31	16 13.61	68.89	14 50.08	0.510
Sun.	18	15 35 52.28	10.401	19 20 10.9	35.45	16 13.81	69.00	14 37.42	0.544
Mon.	19	15 40 2.35	10.435	19 34 11.3	34.57	16 14.01	69.12	14 23.95	0.578
Tues.	20	15 44 13.23	10.469	19 47 50.5	33.68	16 14.21	69.23	14 9.67	0.612
Wed.	21	15 48 24.92	10.503	20 1 8.3	32.77	16 14.40	69.34	13 54.58	0.646
Thur.	22	15 52 37.41	10.536	20 14 4.0	31.85	16 14.58	69.45	13 38.69	0.679
Frid.	23	15 56 50.69	10.569	20 26 37.5	30.92	16 14.76	69.56	13 22.01	0.712
Sat.	24	16 1 4.76	10.602	20 38 48.4	29.97	16 14.94	69.66	13 4.55	0.745
Sun.	25	16 5 19.63	10.635	20 50 36.2	29.00	16 15.11	69.76	12 46.29	0.777
Mon.	26	16 9 35.26	10.667	21 2 0.6	28.02	16 15.27	69.86	12 27.26	0.809
Tues.	27	16 13 51.63	10.697	21 13 1.4	27.03	16 15.43	69.96	12 7.50	0.839
Wed.	28	16 18 8.74	10.727	21 23 38.2	26.03	16 15.59	70.06	11 47.01	0.869
Thur.	29	16 22 26.57	10.757	21 33 50.8	25.01	16 15.75	70.16	11 25.80	0.899
Frid.	30	16 26 45.10	10.786	21 43 38.8	23.97	16 15.90	70.25	11 3.87	0.928
Sat.	31	16 31 4.31	10.813	S. 21 53 1.8	–22.92	16 16.05	70.34	10 41.28	0.955

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.19$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, *to be added to Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean* Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	14 27 10.79	9.813	S. 14 34 8.8	−47.91	16 19.87	0.043	14 43 30.66
Frid.	2	14 31 6.72	9.847	14 53 11.8	47.32	16 20.49	0.009	14 47 27.21
Sat.	3	14 35 3.47	9.882	15 12 0.3	46.70	16 20.30	0.026	14 51 23.77
Sun.	4	14 39 1.06	9.917	15 30 33.7	46.07	16 19.26	0.061	14 55 20.32
Mon.	5	14 42 59.48	9.952	15 48 51.7	45.42	16 17.40	0.096	14 59 16.88
Tues.	6	14 46 58.74	9.987	16 6 54.0	44.76	16 14.69	0.131	15 3 13.43
Wed.	7	14 50 58.84	10.022	16 24 40.2	44.07	16 11.15	0.166	15 7 9.99
Thur.	8	14 54 59.77	10.056	16 42 9.7	43.37	16 6.77	0.200	15 11 6.54
Frid.	9	14 59 1.53	10.091	16 59 22.1	42.65	16 1.57	0.235	15 15 3.10
Sat.	10	15 3 4.13	10.126	17 16 16.9	41.91	15 55.53	0.270	15 18 59.66
Sun.	11	15 7 7.56	10.161	17 32 53.9	41.16	15 48.66	0.305	15 22 56.22
Mon.	12	15 11 11.83	10.195	17 49 12.6	40.39	15 40.94	0.339	15 26 52.77
Tues.	13	15 15 16.94	10.230	18 5 12.7	39.60	15 32.39	0.374	15 30 49.33
Wed.	14	15 19 22.87	10.264	18 20 53.7	38.80	15 23.01	0.408	15 34 45.88
Thur.	15	15 23 29.62	10.299	18 36 15.2	37.98	15 12.82	0.443	15 38 42.44
Frid.	16	15 27 37.20	10.334	18 51 17.0	37.15	15 1.80	0.477	15 42 39.00
Sat.	17	15 31 45.60	10.366	19 5 58.6	36.30	14 49.96	0.510	15 46 35.56
Sun.	18	15 35 54.82	10.400	19 20 19.6	35.44	14 37.29	0.544	15 50 32.11
Mon.	19	15 40 4.86	10.434	19 34 19.7	34.56	14 23.81	0.578	15 54 28.67
Tues.	20	15 44 15.71	10.468	19 47 58.6	33.67	14 9.52	0.612	15 58 25.23
Wed.	21	15 48 27.36	10.502	20 1 16.0	32.76	13 54.43	0.646	16 2 21.79
Thur.	22	15 52 39.81	10.535	20 14 11.4	31.84	13 38.53	0.679	16 6 18.34
Frid.	23	15 56 53.05	10.568	20 26 44.5	30.91	13 21.85	0.712	16 10 14.90
Sat.	24	16 1 7.08	10.601	20 38 55.0	29.96	13 4.38	0.745	16 14 11.46
Sun.	25	16 5 21.90	10.633	20 50 42.4	28.99	12 46.12	0.777	16 18 8.02
Mon.	26	16 9 37.48	10.665	21 2 6.5	28.01	12 27.09	0.809	16 22 4.57
Tues.	27	16 13 53.80	10.695	21 13 7.0	27.02	12 7.33	0.839	16 26 1.13
Wed.	28	16 18 10.85	10.725	21 23 43.5	26.02	11 46.84	0.869	16 29 57.69
Thur.	29	16 22 28.62	10.755	21 33 55.7	25.00	11 25.63	0.899	16 33 54.25
Frid.	30	16 26 47.10	10.784	21 43 43.3	23.96	11 3.70	0.928	16 37 50.80
Sat.	31	16 31 6.25	10.811	S. 21 53 6.0	−22.91	10 41.11	0.955	16 41 47.36

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.
+9ˢ.8565

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S *True* LONGITUDE. λ	THE SUN'S *True* LONGITUDE. λ′	THE SUN'S Diff. for 1 hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	305	219 11 50.9	11 1.1	150.31	−0.56	9.9964359	−45.4	9 14 58.18
2	306	220 11 59.4	11 9.5	150.40	0.68	.9963272	45.1	9 11 2.27
3	307	221 12 10.0	11 20.0	150.48	0.79	.9962190	44.9	9 7 6.36
4	308	222 12 22.6	11 32.4	150.56	0.89	.9961114	44.7	9 3 10.45
5	309	223 12 37.0	11 46.7	150.64	0.95	.9960044	44.5	8 59 14.54
6	310	224 12 53.2	12 2.7	150.71	0.97	.9958979	44.2	8 55 18.63
7	311	225 13 11.1	12 20.5	150.78	0.97	.9957920	43.9	8 51 22.72
8	312	226 13 30.7	12 40.0	150.85	0.93	.9956868	43.6	8 47 26.81
9	313	227 13 51.9	13 1.0	150.91	0.87	.9955824	43.3	8 43 30.90
10	314	228 14 14.5	13 23.4	150.97	0.78	.9954789	42.9	8 39 34.99
11	315	229 14 38.6	13 47.3	151.03	0.68	.9953764	42.4	8 35 39.08
12	316	230 15 4.1	14 12.8	151.09	0.56	.9952750	41.9	8 31 43.17
13	317	231 15 31.0	14 39.6	151.15	0.43	.9951749	41.3	8 27 47.26
14	318	232 15 59.2	15 7.6	151.20	0.30	.9950762	40.7	8 23 51.35
15	319	233 16 28.7	15 36.9	151.26	0.17	.9949791	40.0	8 19 55.43
16	320	234 16 59.5	16 7.5	151.31	−0.06	.9948838	39.3	8 15 59.52
17	321	235 17 31.6	16 39.4	151.37	+0.03	.9947904	38.5	8 12 3.61
18	322	236 18 5.0	17 12.7	151.42	0.10	.9946990	37.6	8 8 7.70
19	323	237 18 39.9	17 47.4	151.48	0.12	.9946098	36.7	8 4 11.78
20	324	238 19 16.0	18 23.3	151.54	0.13	.9945228	35.8	8 0 15.87
21	325	239 19 53.5	19 0.6	151.60	0.09	.9944379	34.9	7 56 19.96
22	326	240 20 32.5	19 39.5	151.66	+0.05	.9943552	33.9	7 52 24.05
23	327	241 21 13.1	20 19.9	151.72	−0.03	.9942748	33.0	7 48 28.14
24	328	242 21 55.1	21 1.7	151.78	0.12	.9941967	32.0	7 44 32.23
25	329	243 22 38.7	21 45.1	151.85	0.24	.9941208	31.1	7 40 36.32
26	330	244 23 23.9	22 30.1	151.92	0.36	.9940470	30.3	7 36 40.41
27	331	245 24 10.7	23 16.7	151.99	0.50	.9939752	29.5	7 32 44.49
28	332	246 24 59.0	24 4.9	152.05	0.63	.9939052	28.8	7 28 48.58
29	333	247 25 48.9	24 54.6	152.11	0.76	.9938370	28.1	7 24 52.67
30	334	248 26 40.2	25 45.7	152.16	0.87	.9937705	27.4	7 20 56.76
31	335	249 27 32.8	26 38.1	152.22	−0.94	9.9937056	−26.7	7 17 0.83

Note: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^s.8296$

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 19.0	16 19.4	59 46.3	+0.23	59 47.9	+0.03	21 9.7	2.04	25.6
2	16 19.2	16 18.2	59 47.0	−0.19	59 43.4	−0.42	21 59.2	2.09	26.6
3	16 16.4	16 13.9	59 37.0	0.65	59 27.8	0.88	22 50.3	2.18	27.6
4	16 10.7	16 6.7	59 15.9	1.11	59 1.3	1.32	23 43.9	2.29	28.6
5	16 2.1	15 57.0	58 44.4	1.50	58 25.5	1.65	☌		0.1
6	15 51.3	15 45.4	58 5.0	1.77	57 43.2	1.86	0 40.0	2.38	1.1
7	15 39.3	15 33.1	57 20.6	1.90	56 57.8	1.90	1 37.6	2.41	2.1
8	15 26.9	15 20.9	56 35.1	1.86	56 13.1	1.79	2 35.0	2.36	3.1
9	15 15.2	15 9.9	55 52.2	1.69	55 32.7	1.56	3 30.2	2.23	4.1
10	15 5.0	15 0.7	55 14.8	1.41	54 58.9	1.24	4 22.1	2.08	5.1
11	14 57.0	14 53.9	54 45.2	1.04	54 33.9	0.84	5 10.1	1.92	6.1
12	14 51.5	14 49.9	54 25.1	0.62	54 19.0	−0.40	5 54.5	1.79	7.1
13	14 48.9	14 48.6	54 15.4	−0.19	54 14.4	+0.03	6 36.2	1.69	8.1
14	14 49.0	14 50.2	54 16.0	+0.24	54 20.2	0.45	7 16.3	1.64	9.1
15	14 52.0	14 54.4	54 26.7	0.64	54 35.6	0.83	7 55.8	1.65	10.1
16	14 57.4	15 0.8	54 46.5	0.99	54 59.3	1.14	8 35.8	1.70	11.1
17	15 4.7	15 9.0	55 13.7	1.26	55 29.5	1.37	9 27.6	1.80	12.1
18	15 13.6	15 18.4	55 46.4	1.44	56 4.0	1.49	10 2.3	1.94	13.1
19	15 23.4	15 28.3	56 22.1	1.52	56 40.4	1.52	10 51.0	2.13	14.1
20	15 33.3	15 38.0	56 58.4	1.49	57 15.9	1.43	11 44.2	2.32	15.1
21	15 42.6	15 46.9	57 32.7	1.36	57 48.5	1.27	12 41.7	2.47	16.1
22	15 50.9	15 54.5	58 3.2	1.17	58 16.5	1.05	13 42.0	2.53	17.1
23	15 57.7	16 0.5	58 28.4	0.93	58 38.7	0.80	14 42.5	2.49	18.1
24	16 3.0	16 5.0	58 47.6	0.68	58 55.0	0.56	15 41.2	2.37	19.1
25	16 6.6	16 7.9	59 1.0	0.45	59 5.7	0.34	16 36.5	2.23	20.1
26	16 8.8	16 9.4	59 9.1	0.24	59 11.3	+0.14	17 28.3	2.10	21.1
27	16 9.7	16 9.7	59 12.4	+0.05	59 12.4	−0.05	18 17.6	2.01	22.1
28	16 9.4	16 8.8	59 11.3	−0.14	59 9.1	0.23	19 5.3	1.98	23.1
29	16 7.9	16 6.7	59 5.7	0.33	59 1.2	0.42	19 53.0	2.00	24.1
30	16 5.1	16 3.2	58 55.5	0.53	58 48.5	0.64	20 41.9	2.08	25.1
31	16 0.9	15 58.3	58 40.1	−0.76	58 30.3	−0.88	21 33.0	2.19	26.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 11 35.91	2.1346	N. 3 27 10.6	16.790
1	11 13 43.96	2.1338	3 10 22.6	16.810
2	11 15 51.97	2.1332	2 53 33.4	16.829
3	11 17 59.95	2.1327	2 36 43.1	16.846
4	11 20 7.89	2.1321	2 19 51.9	16.861
5	11 22 15.80	2.1316	2 2 59.8	16.875
6	11 24 23.68	2.1312	1 46 6.9	16.887
7	11 26 31.54	2.1310	1 29 13.3	16.898
8	11 28 39.40	2.1309	1 12 19.1	16.907
9	11 30 47.25	2.1308	0 55 24.5	16.914
10	11 32 55.09	2.1307	0 38 29.5	16.920
11	11 35 2.93	2.1307	0 21 34.1	16.924
12	11 37 10.78	2.1309	N. 0 4 38.6	16.926
13	11 39 18.64	2.1312	S. 0 12 17.0	16.927
14	11 41 26.52	2.1314	0 29 12.6	16.927
15	11 43 34.41	2.1317	0 46 8.2	16.925
16	11 45 42.33	2.1322	1 3 3.6	16.921
17	11 47 50.28	2.1328	1 19 58.7	16.914
18	11 49 58.27	2.1335	1 36 53.3	16.906
19	11 52 6.30	2.1342	1 53 47.4	16.897
20	11 54 14.37	2.1349	2 10 41.0	16.888
21	11 56 22.49	2.1358	2 27 34.0	16.877
22	11 58 30.67	2.1368	2 44 26.2	16.863
23	12 0 38.91	2.1378	S. 3 1 17.5	16.846

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 2 47.21	2.1389	S. 3 18 7.7	16.828
1	12 4 55.58	2.1401	3 34 56.8	16.809
2	12 7 4.03	2.1414	3 51 44.8	16.790
3	12 9 12.55	2.1428	4 8 31.6	16.768
4	12 11 21.16	2.1443	4 25 17.0	16.744
5	12 13 29.86	2.1458	4 42 0.9	16.718
6	12 15 38.65	2.1473	4 58 43.1	16.690
7	12 17 47.54	2.1490	5 15 23.7	16.662
8	12 19 56.53	2.1508	5 32 2.5	16.632
9	12 22 5.63	2.1526	5 48 39.5	16.600
10	12 24 14.84	2.1544	6 5 14.5	16.566
11	12 26 24.16	2.1563	6 21 47.4	16.530
12	12 28 33.60	2.1583	6 38 18.1	16.492
13	12 30 43.16	2.1604	6 54 46.5	16.453
14	12 32 52.85	2.1627	7 11 12.5	16.413
15	12 35 2.68	2.1650	7 27 36.1	16.372
16	12 37 12.65	2.1673	7 43 57.1	16.328
17	12 39 22.76	2.1697	8 0 15.4	16.282
18	12 41 33.01	2.1721	8 16 30.9	16.234
19	12 43 43.41	2.1746	8 32 43.5	16.185
20	12 45 53.96	2.1772	8 48 53.1	16.135
21	12 48 4.67	2.1799	9 4 59.7	16.083
22	12 50 15.54	2.1826	9 21 3.1	16.029
23	12 52 26.58	2.1853	9 37 3.2	15.972
24	12 54 37.78	2.1882	S. 9 52 59.8	15.914

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 54 37.78	2.1882	S. 9 52 59.8	15.914
1	12 56 49.16	2.1912	10 8 52.9	15.856
2	12 59 0.72	2.1941	10 24 42.5	15.797
3	13 1 12.45	2.1970	10 40 28.5	15.734
4	13 3 24.36	2.2001	10 56 10.6	15.669
5	13 5 36.46	2.2033	11 11 48.8	15.603
6	13 7 48.76	2.2066	11 27 23.0	15.536
7	13 10 1.25	2.2098	11 42 53.1	15.467
8	13 12 13.93	2.2130	11 58 19.0	15.396
9	13 14 26.81	2.2164	12 13 40.6	15.323
10	13 16 39.90	2.2198	12 28 57.8	15.249
11	13 18 53.19	2.2232	12 44 10.5	15.173
12	13 21 6.69	2.2267	12 59 18.6	15.096
13	13 23 20.40	2.2303	13 14 22.0	15.017
14	13 25 34.33	2.2339	13 29 20.6	14.937
15	13 27 48.47	2.2375	13 44 14.4	14.855
16	13 30 2.83	2.2412	13 59 3.2	14.770
17	13 32 17.41	2.2449	14 13 46.8	14.683
18	13 34 32.22	2.2487	14 28 25.2	14.596
19	13 36 47.25	2.2524	14 42 58.3	14.507
20	13 39 2.51	2.2563	14 57 26.1	14.417
21	13 41 18.00	2.2601	15 11 48.4	14.325
22	13 43 33.72	2.2640	15 26 5.1	14.232
23	13 45 49.68	2.2679	S. 15 40 16.2	14.137

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 48 5.87	2.2718	S. 15 54 21.5	14.039
1	13 50 22.30	2.2758	16 8 20.9	13.941
2	13 52 38.97	2.2798	16 22 14.4	13.841
3	13 54 55.88	2.2838	16 36 1.8	13.738
4	13 57 13.03	2.2878	16 49 43.0	13.635
5	13 59 30.42	2.2918	17 3 18.0	13.531
6	14 1 48.05	2.2959	17 16 46.7	13.425
7	14 4 5.93	2.3000	17 30 9.0	13.317
8	14 6 24.05	2.3040	17 43 24.7	13.207
9	14 8 42.41	2.3081	17 56 33.8	13.096
10	14 11 1.02	2.3122	18 9 36.2	12.983
11	14 13 19.88	2.3164	18 22 31.8	12.870
12	14 15 38.99	2.3205	18 35 20.6	12.755
13	14 17 58.34	2.3246	18 48 2.4	12.637
14	14 20 17.94	2.3287	19 0 37.1	12.518
15	14 22 37.79	2.3328	19 13 4.6	12.398
16	14 24 57.88	2.3368	19 25 24.9	12.277
17	14 27 18.21	2.3409	19 37 37.9	12.155
18	14 29 38.79	2.3450	19 49 43.5	12.031
19	14 31 59.61	2.3491	20 1 41.6	11.905
20	14 34 20.68	2.3532	20 13 32.1	11.778
21	14 36 41.99	2.3572	20 25 15.0	11.650
22	14 39 3.54	2.3612	20 36 50.1	11.520
23	14 41 25.33	2.3652	20 48 17.4	11.389
24	14 43 47.36	2.3691	S. 20 59 36.8	11.257

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 5.			
	h m s	s	° ′ ″	″
0	14 43 47.36	2.3691	S.20 59 36.8	11.257
1	14 46 9.62	2.3730	21 10 48.3	11.124
2	14 48 32.12	2.3769	21 21 51.7	10.988
3	14 50 54.85	2.3807	21 32 46.9	10.852
4	14 53 17.81	2.3846	21 43 33.9	10.715
5	14 55 41.00	2.3884	21 54 12.7	10.577
6	14 58 4.42	2.3922	22 4 43.1	10.437
7	15 0 28.06	2.3958	22 15 5.1	10.296
8	15 2 51.92	2.3995	22 25 18.6	10.153
9	15 5 16.00	2.4031	22 35 23.5	10.010
10	15 7 40.29	2.4066	22 45 19.8	9.866
11	15 10 4.79	2.4101	22 55 7.4	9.721
12	15 12 29.50	2.4136	23 4 46.3	9.575
13	15 14 54.42	2.4169	23 14 16.4	9.427
14	15 17 19.53	2.4203	23 23 37.5	9.277
15	15 19 44.84	2.4234	23 32 49.6	9.127
16	15 22 10.34	2.4266	23 41 52.7	8.977
17	15 24 36.03	2.4297	23 50 46.8	8.826
18	15 27 1.91	2.4328	23 59 31.8	8.673
19	15 29 27.97	2.4357	24 8 7.6	8.519
20	15 31 54.20	2.4386	24 16 34.1	8.364
21	15 34 20.60	2.4414	24 24 51.3	8.209
22	15 36 47.17	2.4442	24 32 59.2	8.053
23	15 39 13.90	2.4468	S.24 40 57.7	7.896
	TUESDAY 6.			
0	15 41 40.79	2.4494	S.24 48 46.7	7.738
1	15 44 7.83	2.4518	24 56 26.2	7.579
2	15 46 35.01	2.4542	25 3 56.2	7.421
3	15 49 2.34	2.4566	25 11 16.7	7.261
4	15 51 29.80	2.4588	25 18 27.5	7.099
5	15 53 57.39	2.4608	25 25 28.6	6.937
6	15 56 25.10	2.4628	25 32 20.0	6.776
7	15 58 52.93	2.4647	25 39 1.7	6.614
8	16 1 20.87	2.4665	25 45 33.7	6.452
9	16 3 48.91	2.4682	25 51 55.9	6.288
10	16 6 17.05	2.4698	25 58 8.2	6.123
11	16 8 45.29	2.4713	26 4 10.6	5.958
12	16 11 13.61	2.4727	26 10 3.2	5.793
13	16 13 42.01	2.4739	26 15 45.8	5.627
14	16 16 10.48	2.4751	26 21 18.5	5.462
15	16 18 39.02	2.4762	26 26 41.2	5.296
16	16 21 7.62	2.4771	26 31 54.0	5.129
17	16 23 36.27	2.4778	26 36 56.7	4.962
18	16 26 4.96	2.4785	26 41 49.4	4.795
19	16 28 33.69	2.4791	26 46 32.1	4.627
20	16 31 2.45	2.4796	26 51 4.7	4.459
21	16 33 31.24	2.4799	26 55 27.2	4.292
22	16 36 0.04	2.4801	26 59 39.7	4.124
23	16 38 28.85	2.4802	27 3 42.1	3.956
24	16 40 57.67	2.4802	S.27 7 34.4	3.787

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 7.			
	h m s	s	° ′ ″	″
0	16 40 57.67	2.4802	S.27 7 34.4	3.787
1	16 43 26.48	2.4800	27 11 16.6	3.619
2	16 45 55.27	2.4797	27 14 48.7	3.452
3	16 48 24.04	2.4793	27 18 10.8	3.283
4	16 50 52.79	2.4788	27 21 22.7	3.114
5	16 53 21.50	2.4781	27 24 24.5	2.947
6	16 55 50.16	2.4773	27 27 16.3	2.779
7	16 58 18.77	2.4764	27 29 58.0	2.611
8	17 0 47.33	2.4754	27 32 29.6	2.443
9	17 3 15.82	2.4742	27 34 51.1	2.275
10	17 5 44.23	2.4729	27 37 2.6	2.107
11	17 8 12.57	2.4716	27 39 4.0	1.940
12	17 10 40.82	2.4700	27 40 55.4	1.773
13	17 13 8.97	2.4683	27 42 36.8	1.607
14	17 15 37.02	2.4666	27 44 8.2	1.440
15	17 18 4.96	2.4647	27 45 29.6	1.274
16	17 20 32.78	2.4626	27 46 41.1	1.109
17	17 23 0.47	2.4604	27 47 42.7	0.944
18	17 25 28.03	2.4582	27 48 34.4	0.779
19	17 27 55.45	2.4558	27 49 16.2	0.615
20	17 30 22.72	2.4533	27 49 48.2	0.452
21	17 32 49.84	2.4507	27 50 10.4	0.288
22	17 35 16.80	2.4479	27 50 22.8	−0.125
23	17 37 43.59	2.4451	S.27 50 25.4	+0.037
	THURSDAY 8.			
0	17 40 10.21	2.4422	S.27 50 18.3	0.199
1	17 42 36.65	2.4390	27 50 1.5	0.360
2	17 45 2.89	2.4358	27 49 35.1	0.520
3	17 47 28.94	2.4325	27 48 59.1	0.680
4	17 49 54.79	2.4291	27 48 13.5	0.839
5	17 52 20.43	2.4255	27 47 18.4	0.997
6	17 54 45.85	2.4219	27 46 13.9	1.154
7	17 57 11.05	2.4182	27 44 59.9	1.312
8	17 59 36.03	2.4143	27 43 36.5	1.468
9	18 2 0.77	2.4103	27 42 3.8	1.623
10	18 4 25.27	2.4063	27 40 21.8	1.778
11	18 6 49.52	2.4022	27 38 30.5	1.933
12	18 9 13.53	2.3980	27 36 29.9	2.086
13	18 11 37.28	2.3936	27 34 20.2	2.237
14	18 14 0.76	2.3892	27 32 1.5	2.388
15	18 16 23.98	2.3847	27 29 33.7	2.538
16	18 18 46.93	2.3801	27 26 56.9	2.687
17	18 21 9.59	2.3753	27 24 11.2	2.836
18	18 23 31.97	2.3706	27 21 16.6	2.983
19	18 25 54.06	2.3658	27 18 13.2	3.130
20	18 28 15.86	2.3609	27 15 1.0	3.276
21	18 30 37.37	2.3560	27 11 40.1	3.421
22	18 32 58.58	2.3509	27 8 10.5	3.564
23	18 35 19.48	2.3457	27 4 32.4	3.707
24	18 37 40.07	2.3405	S.27 0 45.7	3.849

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 37 40.07	2.3405	S. 27 0 45.7	3.849
1	18 40 0.34	2.3353	26 56 50.5	3.990
2	18 42 20.30	2.3300	26 52 46.9	4.129
3	18 44 39.94	2.3246	26 48 35.0	4.268
4	18 46 59.25	2.3191	26 44 14.8	4.405
5	18 49 18.23	2.3136	26 39 46.4	4.542
6	18 51 36.88	2.3080	26 35 9.8	4.678
7	18 53 55.19	2.3023	26 30 25.1	4.812
8	18 56 13.16	2.2967	26 25 32.4	4.945
9	18 58 30.79	2.2910	26 20 31.7	5.077
10	19 0 48.08	2.2853	26 15 23.1	5.208
11	19 3 5.03	2.2796	26 10 6.7	5.337
12	19 5 21.63	2.2737	26 4 42.6	5.466
13	19 7 37.87	2.2678	25 59 10.8	5.594
14	19 9 53.76	2.2618	25 53 31.3	5.721
15	19 12 9.29	2.2558	25 47 44.3	5.846
16	19 14 24.46	2.2499	25 41 49.8	5.971
17	19 16 39.28	2.2440	25 35 47.8	6.094
18	19 18 53.74	2.2380	25 29 38.5	6.216
19	19 21 7.84	2.2319	25 23 21.9	6.337
20	19 23 21.57	2.2258	25 16 58.1	6.457
21	19 25 34.94	2.2197	25 10 27.1	6.576
22	19 27 47.94	2.2136	25 3 49.0	6.693
23	19 30 0.57	2.2074	S. 24 57 3.9	6.809

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 32 12.83	2.2013	S. 24 50 11.9	6.924
1	19 34 24.72	2.1952	24 43 13.0	7.038
2	19 36 36.25	2.1891	24 36 7.3	7.152
3	19 38 47.41	2.1829	24 28 54.8	7.264
4	19 40 58.20	2.1767	24 21 35.6	7.375
5	19 43 8.62	2.1706	24 14 9.8	7.484
6	19 45 18.67	2.1644	24 6 37.5	7.592
7	19 47 28.35	2.1582	23 58 58.7	7.700
8	19 49 37.66	2.1521	23 51 13.5	7.807
9	19 51 46.60	2.1459	23 43 21.9	7.912
10	19 53 55.17	2.1398	23 35 24.0	8.016
11	19 56 3.37	2.1337	23 27 20.0	8.118
12	19 58 11.21	2.1276	23 19 9.9	8.219
13	20 0 18.68	2.1214	23 10 53.7	8.321
14	20 2 25.78	2.1153	23 2 31.4	8.421
15	20 4 32.52	2.1093	22 54 3.2	8.519
16	20 6 38.90	2.1032	22 45 29.2	8.616
17	20 8 44.91	2.0972	22 36 49.3	8.713
18	20 10 50.56	2.0912	22 28 3.6	8.809
19	20 12 55.85	2.0852	22 19 12.2	8.902
20	20 15 0.78	2.0792	22 10 15.3	8.994
21	20 17 5.36	2.0733	22 1 12.9	9.086
22	20 19 9.58	2.0674	21 52 5.0	9.177
23	20 21 13.45	2.0615	21 42 51.6	9.268
24	20 23 16.96	2.0556	S. 21 33 32.8	9.357

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 23 16.96	2.0556	S. 21 33 32.8	9.357
1	20 25 20.12	2.0498	21 24 8.7	9.445
2	20 27 22.94	2.0441	21 14 39.4	9.531
3	20 29 25.41	2.0383	21 5 5.0	9.616
4	20 31 27.54	2.0327	20 55 25.5	9.701
5	20 33 29.33	2.0270	20 45 40.9	9.785
6	20 35 30.78	2.0213	20 35 51.3	9.867
7	20 37 31.89	2.0157	20 25 56.8	9.949
8	20 39 32.67	2.0102	20 15 57.4	10.029
9	20 41 33.12	2.0047	20 5 53.3	10.108
10	20 43 33.24	1.9992	19 55 44.4	10.187
11	20 45 33.03	1.9938	19 45 30.8	10.266
12	20 47 32.50	1.9885	19 35 12.5	10.343
13	20 49 31.65	1.9832	19 24 49.7	10.418
14	20 51 30.48	1.9778	19 14 22.4	10.493
15	20 53 28.99	1.9726	19 3 50.6	10.567
16	20 55 27.19	1.9675	18 53 14.4	10.639
17	20 57 25.09	1.9624	18 42 33.9	10.711
18	20 59 22.68	1.9573	18 31 49.1	10.782
19	21 1 19.96	1.9523	18 21 0.1	10.852
20	21 3 16.95	1.9473	18 10 6.9	10.922
21	21 5 13.64	1.9424	17 59 9.5	10.990
22	21 7 10.04	1.9376	17 48 8.1	11.057
23	21 9 6.15	1.9328	S. 17 37 2.7	11.123

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 11 1.97	1.9280	S. 17 25 53.3	11.189
1	21 12 57.51	1.9233	17 14 40.0	11.254
2	21 14 52.77	1.9187	17 3 22.8	11.317
3	21 16 47.75	1.9141	16 52 1.9	11.380
4	21 18 42.46	1.9096	16 40 37.2	11.442
5	21 20 36.91	1.9052	16 29 8.8	11.503
6	21 22 31.09	1.9008	16 17 36.8	11.563
7	21 24 25.01	1.8965	16 6 1.2	11.623
8	21 26 18.67	1.8922	15 54 22.0	11.682
9	21 28 12.07	1.8879	15 42 39.3	11.740
10	21 30 5.22	1.8838	15 30 53.2	11.797
11	21 31 58.13	1.8798	15 19 3.7	11.853
12	21 33 50.80	1.8758	15 7 10.8	11.909
13	21 35 43.23	1.8718	14 55 14.6	11.963
14	21 37 35.42	1.8679	14 43 15.2	12.017
15	21 39 27.38	1.8641	14 31 12.6	12.070
16	21 41 19.11	1.8603	14 19 6.8	12.122
17	21 43 10.62	1.8566	14 6 57.9	12.174
18	21 45 1.91	1.8530	13 54 45.9	12.225
19	21 46 52.98	1.8495	13 42 30.9	12.274
20	21 48 43.85	1.8461	13 30 13.0	12.323
21	21 50 34.51	1.8426	13 17 52.1	12.371
22	21 52 24.96	1.8392	13 5 28.4	12.419
23	21 54 15.22	1.8360	12 53 1.8	12.467
24	21 56 5.28	1.8328	S. 12 40 32.4	12.513

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 12.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 56 5.28	1.8328	S. 12 40 32.4	12.513	0	23 21 43.00	1.7633	S. 1 59 57.2	13.922
1	21 57 55.15	1.8297	12 28 0.2	12.558	1	23 23 28.81	1.7637	1 46 1.5	13.934
2	21 59 44.84	1.8266	12 15 25.4	12.603	2	23 25 14.64	1.7641	1 32 5.1	13.947
3	22 1 34.34	1.8235	12 2 47.9	12.647	3	23 27 0.50	1.7646	1 18 7.9	13.959
4	22 3 23.66	1.8206	11 50 7.8	12.690	4	23 28 46.40	1.7652	1 4 10.0	13.970
5	22 5 12.81	1.8177	11 37 25.1	12.732	5	23 30 32.33	1.7658	0 50 11.5	13.980
6	22 7 1.79	1.8149	11 24 39.9	12.774	6	23 32 18.30	1.7666	0 36 12.4	13.990
7	22 8 50.60	1.8122	11 11 52.2	12.815	7	23 34 4.32	1.7675	0 22 12.7	13.999
8	22 10 39.25	1.8096	10 59 2.1	12.856	8	23 35 50.40	1.7684	S. 0 8 12.5	14.007
9	22 12 27.75	1.8071	10 46 9.5	12.896	9	23 37 36.53	1.7694	N. 0 5 48.1	14.014
10	22 14 16.10	1.8046	10 33 14.6	12.934	10	23 39 22.73	1.7705	0 19 49.2	14.021
11	22 16 4.30	1.8021	10 20 17.4	12.973	11	23 41 8.99	1.7716	0 33 50.7	14.028
12	22 17 52.35	1.7997	10 7 17.9	13.011	12	23 42 55.32	1.7728	0 47 52.6	14.034
13	22 19 40.26	1.7974	9 54 16.1	13.047	13	23 44 41.72	1.7741	1 1 54.8	14.038
14	22 21 28.04	1.7952	9 41 12.2	13.083	14	23 46 28.21	1.7755	1 15 57.2	14.042
15	22 23 15.68	1.7929	9 28 6.1	13.119	15	23 48 14.78	1.7769	1 29 59.8	14.045
16	22 25 3.19	1.7908	9 14 57.9	13.154	16	23 50 1.44	1.7784	1 44 2.6	14.048
17	22 26 50.58	1.7889	9 1 47.6	13.188	17	23 51 48.19	1.7799	1 58 5.5	14.050
18	22 28 37.86	1.7870	8 48 35.3	13.222	18	23 53 35.03	1.7816	2 12 8.6	14.052
19	22 30 25.02	1.7851	8 35 21.0	13.255	19	23 55 21.98	1.7834	2 26 11.7	14.052
20	22 32 12.07	1.7833	8 22 4.7	13.287	20	23 57 9.04	1.7852	2 40 14.8	14.051
21	22 33 59.02	1.7817	8 8 46.5	13.318	21	23 58 56.21	1.7872	2 54 17.8	14.050
22	22 35 45.87	1.7800	7 55 26.5	13.349	22	0 0 43.50	1.7892	3 8 20.8	14.048
23	22 37 32.62	1.7783	S. 7 42 4.6	13.380	23	0 2 30.91	1.7912	N. 3 22 23.6	14.045
	WEDNESDAY 14.					FRIDAY 16.			
0	22 39 19.27	1.7768	S. 7 28 40.9	13.410	0	0 4 18.44	1.7933	N. 3 36 26.2	14.042
1	22 41 5.84	1.7755	7 15 15.4	13.438	1	0 6 6.10	1.7955	3 50 28.6	14.038
2	22 42 52.33	1.7749	7 1 48.3	13.466	2	0 7 53.90	1.7978	4 4 30.8	14.033
3	22 44 38.74	1.7729	6 48 19.5	13.493	3	0 9 41.84	1.8002	4 18 32.6	14.027
4	22 46 25.07	1.7716	6 34 49.1	13.521	4	0 11 29.93	1.8027	4 32 34.0	14.020
5	22 48 11.33	1.7705	6 21 17.0	13.548	5	0 13 18.16	1.8051	4 46 35.0	14.013
6	22 49 57.53	1.7695	6 7 43.3	13.574	6	0 15 6.54	1.8077	5 0 35.6	14.005
7	22 51 43.67	1.7685	5 54 8.1	13.598	7	0 16 55.08	1.8104	5 14 35.6	13.996
8	22 53 29.75	1.7675	5 40 31.5	13.622	8	0 18 43.79	1.8132	5 28 35.1	13.987
9	22 55 15.77	1.7667	5 26 53.5	13.645	9	0 20 32.66	1.8159	5 42 34.0	13.977
10	22 57 1.75	1.7660	5 13 14.1	13.668	10	0 22 21.70	1.8188	5 56 32.3	13.965
11	22 58 47.69	1.7653	4 59 33.3	13.691	11	0 24 10.92	1.8219	6 10 29.8	13.952
12	23 0 33.59	1.7647	4 45 51.2	13.712	12	0 26 0.33	1.8250	6 24 26.5	13.938
13	23 2 19.45	1.7642	4 32 7.8	13.733	13	0 27 49.92	1.8281	6 38 22.4	13.925
14	23 4 5.29	1.7637	4 18 23.2	13.754	14	0 29 39.70	1.8312	6 52 17.5	13.910
15	23 5 51.10	1.7633	4 4 37.3	13.774	15	0 31 29.67	1.8345	7 6 11.6	13.894
16	23 7 36.89	1.7630	3 50 50.3	13.793	16	0 33 19.84	1.8379	7 20 4.7	13.877
17	23 9 22.66	1.7628	3 37 2.2	13.811	17	0 35 10.22	1.8414	7 33 [illegible]	[illegible]
18	23 11 8.42	1.7627	3 23 13.0	13.829	18	0 37 0.81	1.8449	7 47 [illegible]	[illegible]
19	23 12 54.18	1.7626	3 9 22.7	13.847	19	0 38 51.61	1.8484	8 1 [illegible]	[illegible]
20	23 14 39.93	1.7625	2 55 31.4	13.863	20	0 40 42.62	[illegible]	8 15 [illegible]	[illegible]
21	23 16 25.68	1.7626	2 41 39.2	13.878	21	0 42 33.85	[illegible]	[illegible]	[illegible]
22	23 18 11.44	1.7627	2 27 46.1	13.893	22	0 44 25.31	[illegible]	[illegible]	[illegible]
23	23 19 57.21	1.7630	2 13 52.1	13.908	23	0 46 17.01	[illegible]	[illegible]	[illegible]
24	23 21 43.00	1.7633	S. 1 59 57.2	13.922	24	0 48 [illegible]	[illegible]	N. [illegible]	[illegible]

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 48 8.94	1.8675	N. 9 10 28.1	13.711	0	2 23 41.37	2.1372	N.19 20 3.0	11.219
1	0 50 1.11	1.8716	9 24 10.0	13.686	1	2 25 49.81	2.1442	19 31 13.7	11.136
2	0 51 53.53	1.8757	9 37 50.4	13.659	2	2 27 58.67	2.1512	19 42 19.3	11.050
3	0 53 46.20	1.8799	9 51 29.1	13.631	3	2 30 7.95	2.1582	19 53 19.7	10.962
4	0 55 39.12	1.8841	10 5 6.1	13.604	4	2 32 17.65	2.1652	20 4 14.8	10.874
5	0 57 32.29	1.8883	10 18 41.5	13.576	5	2 34 27.77	2.1723	20 15 4.6	10.785
6	0 59 25.72	1.8927	10 32 15.2	13.546	6	2 36 38.32	2.1794	20 25 49.0	10.694
7	1 1 19.42	1.8973	10 45 47.0	13.514	7	2 38 49.30	2.1865	20 36 27.9	10.601
8	1 3 13.40	1.9019	10 59 16.9	13.482	8	2 41 0.70	2.1936	20 47 1.1	10.506
9	1 5 7.65	1.9065	11 12 44.8	13.448	9	2 43 12.53	2.2007	20 57 28.6	10.410
10	1 7 2.18	1.9112	11 26 10.7	13.414	10	2 45 24.79	2.2079	21 7 50.3	10.312
11	1 8 57.00	1.9160	11 39 34.5	13.378	11	2 47 37.48	2.2151	21 18 6.1	10.214
12	1 10 52.10	1.9208	11 52 56.1	13.342	12	2 49 50.60	2.2223	21 28 16.0	10.114
13	1 12 47.49	1.9258	12 6 15.5	13.305	13	2 52 4.15	2.2295	21 38 19.8	10.012
14	1 14 43.19	1.9308	12 19 32.7	13.267	14	2 54 18.14	2.2367	21 48 17.4	9.908
15	1 16 39.19	1.9359	12 32 47.5	13.227	15	2 56 32.56	2.2440	21 58 8.8	9.803
16	1 18 35.50	1.9410	12 45 59.9	13.186	16	2 58 47.42	2.2512	22 7 53.8	9.697
17	1 20 32.11	1.9461	12 59 9.8	13.143	17	3 1 2.71	2.2584	22 17 32.4	9.588
18	1 22 29.03	1.9513	13 12 17.1	13.100	18	3 3 18.43	2.2657	22 27 4.4	9.478
19	1 24 26.27	1.9567	13 25 21.8	13.056	19	3 5 34.59	2.2729	22 36 29.8	9.367
20	1 26 23.84	1.9622	13 38 23.8	13.011	20	3 7 51.18	2.2801	22 45 48.5	9.254
21	1 28 21.73	1.9676	13 51 23.1	12.964	21	3 10 8.20	2.2872	22 55 0.3	9.139
22	1 30 19.95	1.9731	14 4 19.5	12.916	22	3 12 25.65	2.2944	23 4 5.2	9.024
23	1 32 18.51	1.9787	N.14 17 13.0	12.868	23	3 14 43.53	2.3017	N.23 13 3.2	8.908
	SUNDAY 18.					TUESDAY 20.			
0	1 34 17.40	1.9843	N.14 30 3.6	12.818	0	3 17 1.85	2.3089	N.23 21 54.2	8.790
1	1 36 16.63	1.9901	14 42 51.1	12.765	1	3 19 20.60	2.3160	23 30 38.0	8.669
2	1 38 16.21	1.9959	14 55 35.4	12.712	2	3 21 39.77	2.3230	23 39 14.5	8.546
3	1 40 16.14	2.0018	15 8 16.6	12.659	3	3 23 59.36	2.3301	23 47 43.5	8.422
4	1 42 16.42	2.0077	15 20 54.5	12.603	4	3 26 19.38	2.3372	23 56 5.1	8.297
5	1 44 17.06	2.0137	15 33 29.0	12.547	5	3 28 39.83	2.3443	24 4 19.2	8.171
6	1 46 18.06	2.0197	15 46 0.1	12.489	6	3 31 0.70	2.3513	24 12 25.6	8.043
7	1 48 19.42	2.0257	15 58 27.7	12.430	7	3 33 21.99	2.3582	24 20 24.3	7.913
8	1 50 21.15	2.0319	16 10 51.7	12.369	8	3 35 43.69	2.3652	24 28 15.2	7.782
9	1 52 23.25	2.0382	16 23 12.0	12.307	9	3 38 5.81	2.3721	24 35 58.1	7.649
10	1 54 25.73	2.0444	16 35 28.6	12.245	10	3 40 28.34	2.3788	24 43 33.0	7.515
11	1 56 28.58	2.0507	16 47 41.4	12.181	11	3 42 51.27	2.3856	24 50 59.9	7.380
12	1 58 31.81	2.0571	16 59 50.3	12.115	12	3 45 14.61	2.3923	24 58 18.6	7.243
13	2 0 35.43	2.0635	17 11 55.2	12.048	13	3 47 38.35	2.3990	25 5 29.0	7.104
14	2 2 39.43	2.0699	17 23 56.1	11.980	14	3 50 2.49	2.4057	25 12 31.1	6.964
15	2 4 43.82	2.0765	17 35 52.8	11.909	15	3 52 27.03	2.4122	25 19 24.7	6.823
16	2 6 48.61	2.0831	17 47 45.2	11.838	16	3 54 51.96	2.4187	25 26 9.8	6.680
17	2 8 53.79	2.0897	17 59 33.4	11.767	17	3 57 17.27	2.4250	25 32 46.3	6.535
18	2 10 59.37	2.0964	18 11 17.2	11.693	18	3 59 42.96	2.4313	25 39 14.0	6.389
19	2 13 5.35	2.1031	18 22 56.5	11.618	19	4 2 9.03	2.4376	25 45 33.0	6.242
20	2 15 11.74	2.1098	18 34 31.3	11.541	20	4 4 35.47	2.4438	25 51 43.1	6.094
21	2 17 18.53	2.1166	18 46 1.4	11.462	21	4 7 2.29	2.4500	25 57 44.3	5.945
22	2 19 25.73	2.1234	18 57 26.8	11.383	22	4 9 29.47	2.4560	26 3 36.5	5.794
23	2 21 33.34	2.1303	19 8 47.4	11.302	23	4 11 57.01	2.4619	26 9 19.6	5.642
24	2 23 41.37	2.1372	N.19 20 3.0	11.219	24	4 14 24.90	2.4677	N.26 14 53.5	5.488

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 14 24.90	2.4677	N.26 14 53.5	5.488
1	4 16 53.14	2.4735	26 20 18.1	5.333
2	4 19 21.72	2.4791	26 25 33.4	5.177
3	4 21 50.63	2.4846	26 30 39.3	5.019
4	4 24 19.87	2.4901	26 35 35.7	4.860
5	4 26 49.44	2.4954	26 40 22.5	4.700
6	4 29 19.32	2.5006	26 44 59.7	4.539
7	4 31 49.51	2.5057	26 49 27.2	4.377
8	4 34 20.01	2.5107	26 53 45.0	4.214
9	4 36 50.80	2.5156	26 57 52.9	4.049
10	4 39 21.88	2.5204	27 1 50.9	3.884
11	4 41 53.25	2.5251	27 5 39.0	3.718
12	4 44 24.89	2.5296	27 9 17.1	3.551
13	4 46 56.80	2.5340	27 12 45.1	3.382
14	4 49 28.97	2.5382	27 16 2.9	3.212
15	4 52 1.38	2.5422	27 19 10.6	3.042
16	4 54 34.03	2.5462	27 22 8.0	2.870
17	4 57 6.92	2.5501	27 24 55.0	2.698
18	4 59 40.04	2.5538	27 27 31.7	2.525
19	5 2 13.37	2.5573	27 29 58.0	2.351
20	5 4 46.91	2.5608	27 32 13.8	2.176
21	5 7 20.66	2.5641	27 34 19.1	2.001
22	5 9 54.60	2.5672	27 36 13.9	1.826
23	5 12 28.72	2.5701	N.27 37 58.2	1.650

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 15 3.01	2.5729	N.27 39 31.9	1.472
1	5 17 37.47	2.5756	27 40 54.9	1.293
2	5 20 12.08	2.5781	27 42 7.1	1.114
3	5 22 46.84	2.5804	27 43 8.6	0.935
4	5 25 21.73	2.5826	27 43 59.3	0.755
5	5 27 56.75	2.5847	27 44 39.2	0.576
6	5 30 31.90	2.5867	27 45 8.4	0.396
7	5 33 7.16	2.5884	27 45 26.7	0.214
8	5 35 42.51	2.5898	27 45 34.1	+0.033
9	5 38 17.94	2.5912	27 45 30.7	−0.148
10	5 40 53.45	2.5925	27 45 16.4	0.330
11	5 43 29.04	2.5937	27 44 51.1	0.512
12	5 46 4.69	2.5946	27 44 14.9	0.694
13	5 48 40.39	2.5953	27 43 27.8	0.877
14	5 51 16.13	2.5959	27 42 29.7	1.059
15	5 53 51.90	2.5963	27 41 20.7	1.242
16	5 56 27.69	2.5966	27 40 0.7	1.424
17	5 59 3.49	2.5967	27 38 29.8	1.607
18	6 1 39.30	2.5967	27 36 47.9	1.789
19	6 4 15.10	2.5965	27 34 55.1	1.972
20	6 6 50.88	2.5961	27 32 51.3	2.154
21	6 9 26.63	2.5956	27 30 36.6	2.336
22	6 12 2.35	2.5949	27 28 11.0	2.518
23	6 14 38.02	2.5941	27 25 34.5	2.700
24	6 17 13.64	2.5932	N.27 22 47.0	2.882

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 17 13.64	2.5932	N.27 22 47.0	2.882
1	6 19 49.20	2.5920	27 19 48.7	3.063
2	6 22 24.68	2.5906	27 16 39.5	3.244
3	6 25 0.07	2.5891	27 13 19.4	3.425
4	6 27 35.37	2.5876	27 9 48.5	3.606
5	6 30 10.58	2.5859	27 6 6.8	3.784
6	6 32 45.68	2.5840	27 2 14.4	3.963
7	6 35 20.66	2.5819	26 58 11.2	4.142
8	6 37 55.51	2.5797	26 53 57.3	4.321
9	6 40 30.23	2.5775	26 49 32.7	4.498
10	6 43 4.81	2.5750	26 44 57.5	4.675
11	6 45 39.23	2.5723	26 40 11.7	4.852
12	6 48 13.49	2.5696	26 35 15.3	5.027
13	6 50 47.58	2.5667	26 30 8.4	5.202
14	6 53 21.50	2.5638	26 24 51.1	5.376
15	6 55 55.24	2.5607	26 19 23.3	5.550
16	6 58 28.79	2.5575	26 13 45.1	5.722
17	7 1 2.14	2.5541	26 7 56.6	5.893
18	7 3 35.28	2.5506	26 1 57.9	6.063
19	7 6 8.21	2.5471	25 55 49.0	6.233
20	7 8 40.93	2.5434	25 49 29.9	6.403
21	7 11 13.42	2.5396	25 43 0.6	6.572
22	7 13 45.68	2.5357	25 36 21.3	6.738
23	7 16 17.70	2.5316	N.25 29 32.0	6.904

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 18 49.47	2.5274	N.25 22 32.8	7.069
1	7 21 20.99	2.5232	25 15 23.7	7.233
2	7 23 52.26	2.5190	25 8 4.8	7.396
3	7 26 23.27	2.5147	25 0 36.2	7.557
4	7 28 54.02	2.5102	24 52 57.9	7.717
5	7 31 24.49	2.5056	24 45 10.1	7.877
6	7 33 54.69	2.5010	24 37 12.7	8.036
7	7 36 24.61	2.4962	24 29 5.8	8.193
8	7 38 54.24	2.4914	24 20 49.6	8.348
9	7 41 23.58	2.4865	24 12 24.1	8.502
10	7 43 52.62	2.4816	24 3 49.4	8.655
11	7 46 21.37	2.4767	23 55 5.5	8.807
12	7 48 49.82	2.4716	23 46 12.5	8.958
13	7 51 17.96	2.4664	23 37 10.5	9.107
14	7 53 45.79	2.4613	23 27 59.6	9.255
15	7 56 13.32	2.4561	23 18 39.9	9.402
16	7 58 40.53	2.4508	23 9 11.4	9.547
17	8 1 7.42	2.4455	22 59 34.2	9.691
18	8 3 33.99	2.4402	22 49 48.5	9.833
19	8 6 0.24	2.4348	22 39 54.3	9.974
20	8 8 26.16	2.4293	22 29 51.6	10.114
21	8 10 51.76	2.4239	22 19 40.6	10.252
22	8 13 17.03	2.4184	22 9 21.3	10.389
23	8 15 41.97	2.4128	21 58 53.9	10.524
24	8 18 6.57	2.4072	N.21 48 18.4	10.658

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 18 6.57	2.4072	N.21 48 18.4	10.658
1	8 20 30.84	2.4017	21 37 34.9	10.791
2	8 22 54.78	2.3962	21 26 43.5	10.921
3	8 25 18.39	2.3907	21 15 44.4	11.049
4	8 27 41.66	2.3851	21 4 37.6	11.177
5	8 30 4.60	2.3795	20 53 23.1	11.304
6	8 32 27.20	2.3739	20 42 1.1	11.429
7	8 34 49.47	2.3683	20 30 31.6	11.552
8	8 37 11.40	2.3627	20 18 54.8	11.673
9	8 39 32.99	2.3571	20 7 10.8	11.793
10	8 41 54.25	2.3515	19 55 19.6	11.912
11	8 44 15.17	2.3459	19 43 21.3	12.029
12	8 46 35.76	2.3404	19 31 16.1	12.144
13	8 48 56.02	2.3348	19 19 4.0	12.258
14	8 51 15.94	2.3292	19 6 45.1	12.371
15	8 53 35.53	2.3237	18 54 19.5	12.482
16	8 55 54.79	2.3182	18 41 47.3	12.591
17	8 58 13.72	2.3128	18 29 8.6	12.698
18	9 0 32.33	2.3074	18 16 23.5	12.804
19	9 2 50.61	2.3019	18 3 32.1	12.909
20	9 5 8.56	2.2965	17 50 34.4	13.012
21	9 7 26.19	2.2912	17 37 30.6	13.113
22	9 9 43.50	2.2858	17 24 20.8	13.213
23	9 12 0.49	2.2806	N.17 11 5.0	13.312

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 14 17.17	2.2753	N.16 57 43.4	13.408
1	9 16 33.53	2.2701	16 44 16.1	13.503
2	9 18 49.58	2.2649	16 30 43.1	13.597
3	9 21 5.32	2.2598	16 17 4.5	13.689
4	9 23 20.76	2.2548	16 3 20.4	13.779
5	9 25 35.90	2.2498	15 49 31.0	13.867
6	9 27 50.73	2.2448	15 35 36.3	13.955
7	9 30 5.27	2.2399	15 21 36.4	14.041
8	9 32 19.52	2.2351	15 7 31.4	14.124
9	9 34 33.48	2.2302	14 53 21.5	14.206
10	9 36 47.15	2.2254	14 39 6.7	14.287
11	9 39 0.53	2.2207	14 24 47.0	14.367
12	9 41 13.63	2.2161	14 10 22.6	14.445
13	9 43 26.46	2.2116	13 55 53.6	14.521
14	9 45 39.02	2.2070	13 41 20.1	14.596
15	9 47 51.30	2.2025	13 26 42.1	14.669
16	9 50 3.32	2.1982	13 11 59.8	14.741
17	9 52 15.08	2.1939	12 57 13.2	14.812
18	9 54 26.59	2.1897	12 42 22.4	14.880
19	9 56 37.84	2.1854	12 27 27.6	14.947
20	9 58 48.84	2.1813	12 12 28.8	15.013
21	10 0 59.60	2.1773	11 57 26.1	15.077
22	10 3 10.12	2.1733	11 42 19.6	15.139
23	10 5 20.40	2.1694	11 27 9.4	15.200
24	10 7 30.45	2.1656	N.11 11 55.6	15.259

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 7 30.45	2.1656	N.11 11 55.6	15.259
1	10 9 40.28	2.1619	10 56 38.3	15.317
2	10 11 49.88	2.1582	10 41 17.6	15.373
3	10 13 59.26	2.1546	10 25 53.5	15.428
4	10 16 8.43	2.1511	10 10 26.2	15.482
5	10 18 17.39	2.1476	9 54 55.7	15.534
6	10 20 26.14	2.1442	9 39 22.1	15.585
7	10 22 34.69	2.1409	9 23 45.5	15.633
8	10 24 43.05	2.1378	9 8 6.1	15.680
9	10 26 51.23	2.1347	8 52 23.9	15.726
10	10 28 59.22	2.1317	8 36 39.0	15.771
11	10 31 7.03	2.1287	8 20 51.4	15.814
12	10 33 14.66	2.1258	8 5 1.3	15.856
13	10 35 22.12	2.1230	7 49 8.8	15.896
14	10 37 29.42	2.1203	7 33 13.9	15.934
15	10 39 36.56	2.1177	7 17 16.7	15.972
16	10 41 43.54	2.1151	7 1 17.3	16.007
17	10 43 50.37	2.1127	6 45 15.8	16.041
18	10 45 57.06	2.1103	6 29 12.4	16.073
19	10 48 3.61	2.1080	6 13 7.0	16.105
20	10 50 10.02	2.1058	5 56 59.8	16.135
21	10 52 16.30	2.1037	5 40 50.8	16.163
22	10 54 22.46	2.1017	5 24 40.2	16.190
23	10 56 28.50	2.0997	N. 5 8 28.0	16.216

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 58 34.43	2.0979	N. 4 52 14.3	16.240
1	11 0 40.25	2.0962	4 35 59.2	16.262
2	11 2 45.97	2.0945	4 19 42.8	16.283
3	11 4 51.59	2.0929	4 3 25.2	16.303
4	11 6 57.12	2.0914	3 47 6.4	16.322
5	11 9 2.56	2.0899	3 30 46.5	16.339
6	11 11 7.91	2.0885	3 14 25.7	16.354
7	11 13 13.18	2.0873	2 58 4.0	16.368
8	11 15 18.39	2.0863	2 41 41.5	16.382
9	11 17 23.54	2.0853	2 25 18.2	16.393
10	11 19 28.63	2.0843	2 8 54.3	16.402
11	11 21 33.66	2.0833	1 52 29.9	16.410
12	11 23 38.63	2.0826	1 36 5.1	16.417
13	11 25 43.56	2.0819	1 19 39.9	16.423
14	11 27 48.46	2.0813	1 3 14.4	16.428
15	11 29 53.32	2.0807	0 46 48.6	16.431
16	11 31 58.15	2.0802	0 30 22.7	16.432
17	11 34 2.95	2.0799	N. 0 13 56.8	16.432
18	11 36 7.74	2.0797	S. 0 2 29.1	16.431
19	11 38 12.52	2.0796	0 18 54.9	16.428
20	11 40 17.29	2.0794	0 35 20.4	16.423
21	11 42 22.05	2.0794	0 51 45.6	16.417
22	11 44 26.82	2.0795	1 8 10.4	16.410
23	11 46 31.59	2.0797	1 24 34.8	16.402
24	11 48 36.38	2.0800	S. 1 40 58.6	16.392

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 48 36.38	2.0800	S. 1 40 58.6	16.392
1	11 50 41.19	2.0803	1 57 21.8	16.380
2	11 52 46.02	2.0807	2 13 44.2	16.367
3	11 54 50.88	2.0812	2 30 5.8	16.352
4	11 56 55.77	2.0819	2 46 26.5	16.337
5	11 59 0.71	2.0827	3 2 46.3	16.321
6	12 1 5.69	2.0834	3 19 5.0	16.303
7	12 3 10.72	2.0842	3 35 22.6	16.283
8	12 5 15.80	2.0852	3 51 38.9	16.261
9	12 7 20.94	2.0863	4 7 53.9	16.238
10	12 9 26.15	2.0874	4 24 7.5	16.214
11	12 11 31.43	2.0886	4 40 19.6	16.188
12	12 13 36.78	2.0898	4 56 30.1	16.162
13	12 15 42.21	2.0912	5 12 39.0	16.134
14	12 17 47.73	2.0927	5 28 46.2	16.104
15	12 19 53.34	2.0942	5 44 51.5	16.072
16	12 21 59.04	2.0958	6 0 54.9	16.040
17	12 24 4.84	2.0976	6 16 56.3	16.006
18	12 26 10.75	2.0994	6 32 55.6	15.970
19	12 28 16.77	2.1013	6 48 52.7	15.933
20	12 30 22.90	2.1032	7 4 47.6	15.896
21	12 32 29.15	2.1052	7 20 40.2	15.856
22	12 34 35.53	2.1073	7 36 30.3	15.814
23	12 36 42.03	2.1094	7 52 17.9	15.772
24	12 38 48.66	2.1117	S. 8 8 3.0	15.729

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 38 48.66	2.1117	S. 8 8 3.0	15.729
1	12 40 55.43	2.1141	8 23 45.4	15.683
2	12 43 2.35	2.1165	8 39 25.0	15.636
3	12 45 9.41	2.1189	8 55 1.7	15.588
4	12 47 16.62	2.1215	9 10 35.5	15.538
5	12 49 23.99	2.1241	9 26 6.3	15.487
6	12 51 31.51	2.1268	9 41 33.9	15.434
7	12 53 39.20	2.1296	9 56 58.3	15.380
8	12 55 47.06	2.1324	10 12 19.5	15.325
9	12 57 55.09	2.1353	10 27 37.3	15.268
10	13 0 3.29	2.1383	10 42 51.6	15.209
11	13 2 11.68	2.1413	10 58 2.4	15.149
12	13 4 20.25	2.1444	11 13 9.5	15.088
13	13 6 29.01	2.1476	11 28 12.9	15.025
14	13 8 37.96	2.1508	11 43 12.5	14.961
15	13 10 47.10	2.1540	11 58 8.2	14.895
16	13 12 56.44	2.1574	12 12 59.9	14.828
17	13 15 5.99	2.1608	12 27 47.6	14.760
18	13 17 15.74	2.1642	12 42 31.1	14.690
19	13 19 25.70	2.1677	12 57 10.4	14.618
20	13 21 35.87	2.1713	13 11 45.3	14.545
21	13 23 46.26	2.1750	13 26 15.8	14.471
22	13 25 56.87	2.1787	13 40 41.8	14.395
23	13 28 7.70	2.1824	13 55 3.2	14.317
24	13 30 18.76	2.1862	S. 14 9 19.9	14.238

PHASES OF THE MOON.

	d	h	m
● New Moon, ...	4	20	48.0
☽ First Quarter, ...	12	11	44.2
○ Full Moon, ...	20	10	19.3
☾ Last Quarter, ...	27	10	5.8

	d	h
☾ Perigee, ...	1	13.7
☾ Apogee, ...	13	10.5
☾ Perigee, ...	27	6.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P.L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	56° 29′ 33″	2217	58° 17′ 35″	2214	60° 5′ 42″	2211	61° 53′ 53″	2210
	Regulus	W.	19 30 6	2206	21 18 25	2203	23 6 48	2201	24 55 14	2199
	Sun	E.	51 41 4	2543	50 0 51	2543	48 20 37	2542	46 40 22	2542
2	Pollux	W.	70 55 15	2206	72 43 34	2207	74 31 51	2208	76 20 7	2210
	Regulus	W.	33 57 50	2197	35 46 22	2198	37 34 53	2199	39 23 22	2201
	Sun	E.	38 19 24	2551	36 39 22	2556	34 59 27	2561	33 19 39	2566
3	Pollux	W.	85 20 36	2225	87 8 27	2229	88 56 12	2234	90 43 49	2239
	Regulus	W.	48 24 56	2216	50 13 0	2220	52 0 57	2225	53 48 47	2231
7	Sun	W.	27 36 31	2973	29 7 17	2984	30 37 50	2996	32 8 8	3007
	α Aquilæ	E.	57 2 38	3653	55 45 1	3713	54 28 28	3777	53 13 2	3845
	Fomalhaut	E.	78 40 17	2887	77 7 41	2906	75 35 30	2927	74 3 45	2947
	Saturn	E.	91 4 59	2564	89 25 15	2580	87 45 52	2595	86 6 50	2611
	Mars	E.	92 22 48	2689	90 45 53	2704	89 9 19	2721	87 33 7	2737
	α Pegasi	E.	100 26 11	2768	98 51 1	2783	97 16 11	2797	95 41 39	2811
8	Sun	W.	39 35 43	3075	41 4 23	3090	42 32 45	3105	44 0 49	3119
	Fomalhaut	E.	66 31 54	3064	65 3 0	3089	63 34 37	3115	62 6 46	3143
	Saturn	E.	77 56 59	2689	76 20 4	2704	74 43 29	2719	73 7 15	2735
	Mars	E.	79 37 27	2818	78 3 22	2835	76 29 39	2851	74 56 17	2866
	α Pegasi	E.	87 53 43	2887	86 21 7	2903	84 48 52	2919	83 16 57	2935
9	Sun	W.	51 16 42	3193	52 43 0	3207	54 9 1	3221	55 34 45	3236
	Fomalhaut	E.	54 56 5	3295	53 31 48	3329	52 8 10	3365	50 45 14	3404
	Saturn	E.	65 11 7	2809	63 36 51	2824	62 2 54	2838	60 29 15	2852
	Mars	E.	67 14 28	2944	65 43 5	2959	64 12 1	2974	62 41 16	2989
	α Pegasi	E.	75 42 38	3020	74 12 50	3037	72 43 23	3055	71 14 18	3073
10	Sun	W.	62 39 24	3301	64 3 34	3313	65 27 30	3325	66 51 12	3337
	Jupiter	W.	18 14 35	3085	19 43 3	3084	21 11 32	3083	22 40 2	3084
	Venus	W.	17 44 2	3345	19 7 21	3356	20 30 28	3366	21 53 23	3377
	Fomalhaut	E.	44 2 8	3630	42 44 6	3685	41 27 3	3744	40 11 2	3809
	Saturn	E.	52 45 25	2918	51 13 29	2930	49 41 48	2942	48 10 23	2954
	Mars	E.	55 11 54	3057	53 42 52	3069	52 14 5	3082	50 45 33	3094
	α Pegasi	E.	63 54 22	3163	62 27 29	3182	61 0 58	3202	59 34 51	3221
	α Arietis	E.	105 24 16	2928	103 52 33	2939	102 21 4	2950	100 49 49	2961
11	Sun	W.	73 46 32	3388	75 9 2	3398	76 31 21	3407	77 53 30	3415
	Jupiter	W.	30 1 41	3105	31 29 44	3110	32 57 41	3115	34 25 32	3121
	Venus	W.	28 45 2	3426	30 6 49	3435	31 28 26	3443	32 49 54	3451
	Saturn	E.	40 36 48	3008	39 6 45	3018	37 36 54	3027	36 7 15	3037
	Mars	E.	43 26 26	3149	41 59 16	3159	40 32 18	3168	39 5 31	3178
	α Pegasi	E.	52 30 10	3325	51 6 28	3349	49 43 13	3373	48 20 26	3397
	α Arietis	E.	93 16 46	3009	91 46 45	3018	90 16 54	3026	88 47 13	3033
12	Sun	W.	84 42 9	3448	86 3 31	3453	87 24 48	3458	88 45 59	3462
	Jupiter	W.	41 43 16	3143	43 10 24	3147	44 37 47	3150	46 4 56	3153
	Venus	W.	39 35 12	3483	40 55 55	3488	42 16 33	3492	43 37 6	3497
	Saturn	E.	28 41 50	3082	27 13 18	3090	25 44 56	3099	24 16 45	3108
	Mars	E.	31 54 12	3218	30 28 24	3226	29 2 46	3233	27 37 16	3240
	α Arietis	E.	81 20 58	3065	79 52 5	3069	78 23 18	3073	76 54 36	3078

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	63° 42′ 6″	2206	65° 30′ 21″	2207	67° 18′ 38″	2206	69° 6′ 56″	2206
	Regulus	W.	26 43 43	2196	28 32 13	2197	30 20 45	2197	32 9 17	2196
	Sun	E.	45 0 7	2543	43 19 53	2543	41 39 40	2545	39 59 30	2548
2	Pollux	W.	78 8 20	2212	79 56 30	2214	81 44 37	2217	83 32 39	2220
	Regulus	W.	41 11 48	2203	43 0 11	2206	44 48 31	2208	46 36 46	2212
	Sun	E.	31 40 0	2576	30 0 32	2585	28 21 16	2596	26 42 15	2609
3	Pollux	W.	92 31 18	2245	94 18 39	2251	96 5 50	2258	97 52 51	2266
	Regulus	W.	55 36 29	2237	57 24 2	2243	59 11 26	2249	60 58 40	2258
7	Sun	W.	33 38 12	3020	35 8 0	3034	36 37 31	3047	38 6 46	3061
	α Aquilæ	E.	51 58 46	3918	50 45 44	3997	49 34 1	4080	48 23 40	4169
	Fomalhaut	E.	72 32 26	2969	71 1 35	2992	69 31 12	3015	68 1 18	3039
	Saturn	E.	84 28 10	2626	82 49 50	2642	81 11 52	2657	79 34 15	2673
	Mars	E.	85 57 16	2753	84 21 47	2769	82 46 39	2785	81 11 52	2802
	α Pegasi	E.	94 7 25	2826	92 33 31	2840	90 59 55	2855	89 26 39	2871
8	Sun	W.	45 28 35	3134	46 56 3	3148	48 23 14	3163	49 50 7	3178
	Fomalhaut	E.	60 39 28	3171	59 12 44	3200	57 46 35	3230	56 21 1	3262
	Saturn	E.	71 31 22	2750	69 55 49	2765	68 20 35	2780	66 45 41	2795
	Mars	E.	73 23 15	2883	71 50 34	2898	70 18 12	2913	68 46 10	2929
	α Pegasi	E.	81 45 23	2952	80 14 10	2969	78 43 18	2985	77 12 47	3003
9	Sun	W.	57 0 12	3249	58 25 23	3262	59 50 19	3276	61 14 59	3288
	Fomalhaut	E.	49 23 2	3444	48 1 35	3486	46 40 55	3531	45 21 5	3579
	Saturn	E.	58 55 55	2866	57 22 52	2879	55 50 6	2892	54 17 37	2905
	Mars	E.	61 10 49	3003	59 40 40	3017	58 10 48	3030	56 41 13	3043
	α Pegasi	E.	69 45 35	3091	68 17 14	3108	66 49 14	3127	65 21 37	3145
10	Sun	W.	68 14 41	3348	69 37 57	3359	71 1 0	3369	72 23 52	3379
	Jupiter	W.	24 8 31	3087	25 36 56	3091	27 5 17	3096	28 33 32	3101
	Venus	W.	23 16 6	3387	24 38 37	3398	26 0 56	3407	27 23 5	3417
	Fomalhaut	E.	38 56 9	3879	37 42 28	3955	36 30 4	4039	35 19 3	4139
	Saturn	E.	46 39 12	2965	45 8 16	2976	43 37 33	2987	42 7 4	2997
	Mars	E.	49 17 16	3105	47 49 13	3117	46 21 24	3128	44 53 48	3139
	α Pegasi	E.	58 9 7	3241	56 43 46	3262	55 18 50	3282	53 54 18	3303
	α Arietis	E.	99 18 47	2971	97 47 58	2981	96 17 22	2991	94 46 58	3001
11	Sun	W.	79 15 30	3422	80 37 22	3430	81 59 5	3436	83 20 41	3443
	Jupiter	W.	35 53 16	3126	37 20 54	3130	38 48 27	3135	40 15 54	3139
	Venus	W.	34 11 13	3458	35 32 24	3465	36 53 27	3471	38 14 23	3478
	Saturn	E.	34 37 48	3046	33 8 32	3055	31 39 27	3064	30 10 33	3073
	Mars	E.	37 38 55	3186	36 12 29	3195	34 46 14	3203	33 20 8	3211
	α Pegasi	E.	46 58 6	3423	45 36 16	3452	44 14 58	3482	42 54 14	3512
	α Arietis	E.	87 17 41	3040	85 48 18	3047	84 19 4	3053	82 49 57	3060
12	Sun	W.	90 7 6	3465	91 28 9	3469	92 49 8	3471	94 10 5	3473
	Jupiter	W.	47 32 2	3155	48 59 5	3157	50 26 6	3158	51 53 5	3160
	Venus	W.	44 57 34	3500	46 17 58	3502	47 38 20	3505	48 58 39	3506
	Saturn	E.	22 48 45	3118	21 20 57	3130	19 53 24	3143	18 26 7	3158
	Mars	E.	26 11 54	3247	24 46 41	3255	23 21 37	3262	21 56 41	3270
	α Arietis	E.	75 25 59	3082	73 57 27	3084	72 28 58	3087	71 0 33	3089

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Sun	W.	95° 30′ 59″	3474	96° 51′ 52″	3476	98° 12′ 43″	3476	99° 33′ 34″	3476
	Jupiter	W.	53 20 2	3160	54 46 59	3161	56 13 55	3160	57 40 52	3160
	Venus	W.	50 18 57	3507	51 39 13	3507	52 59 29	3508	54 19 44	3507
	α Aquilæ	W.	38 54 14	5559	39 44 17	5401	40 36 11	5260	41 29 48	5129
	α Arietis	E.	69 32 10	3091	68 3 49	3092	66 35 30	3092	65 7 11	3093
14	Sun	W.	106 18 1	3468	107 39 1	3465	109 0 4	3462	110 21 11	3457
	Jupiter	W.	64 55 57	3150	66 23 6	3146	67 50 20	3143	69 17 38	3138
	Venus	W.	61 1 20	3497	62 21 47	3494	63 42 18	3490	65 2 53	3486
	α Aquilæ	W.	46 20 19	4630	47 22 18	4553	48 25 24	4489	49 29 32	4415
	α Arietis	E.	57 45 34	3088	56 17 10	3087	54 48 44	3084	53 20 15	3081
	Aldebaran	E.	89 37 12	3135	88 9 45	3132	86 42 14	3129	85 14 39	3125
15	Sun	W.	117 8 4	3431	118 29 45	3424	119 51 34	3417	121 13 31	3410
	Jupiter	W.	76 35 38	3110	78 3 35	3104	79 31 40	3097	80 59 53	3089
	Venus	W.	71 47 19	3455	73 8 33	3447	74 29 56	3440	75 51 27	3431
	α Aquilæ	W.	55 4 10	4140	56 13 33	4095	57 23 40	4053	58 34 27	4012
	α Arietis	E.	45 56 47	3062	44 27 51	3057	42 58 49	3053	41 29 42	3048
	Aldebaran	E.	77 55 30	3101	76 27 22	3096	74 59 8	3090	73 30 46	3084
16	Sun	W.	128 5 25	3369	129 28 17	3360	130 51 19	3351	132 14 32	3342
	Jupiter	W.	88 23 26	3047	89 52 41	3037	91 22 8	3028	92 51 46	3018
	Venus	W.	82 41 32	3385	84 4 6	3375	85 26 51	3364	86 49 49	3353
	α Aquilæ	W.	64 37 51	3838	65 52 14	3808	67 7 8	3779	68 22 32	3751
	Saturn	W.	19 27 41	3034	20 57 12	3015	22 27 6	2998	23 57 21	2982
	Aldebaran	E.	66 7 1	3051	64 37 51	3043	63 8 32	3036	61 39 4	3030
17	Jupiter	W.	100 23 11	2964	101 54 9	2954	103 25 20	2942	104 56 46	2930
	Venus	W.	93 47 55	3294	95 12 14	3282	96 36 47	3269	98 1 35	3255
	α Aquilæ	W.	74 46 23	3631	76 4 24	3609	77 22 49	3588	78 41 36	3569
	Fomalhaut	W.	48 27 45	3459	49 48 55	3423	51 10 46	3387	52 33 17	3354
	Saturn	W.	31 33 19	2911	33 5 24	2898	34 37 46	2884	36 10 25	2870
	α Pegasi	W.	27 17 20	3999	28 29 1	3880	29 42 41	3777	30 58 7	3687
	Mars	W.	26 11 51	3068	27 40 40	3053	29 9 47	3039	30 39 12	3025
	Aldebaran	E.	54 9 34	2994	52 39 14	2987	51 8 45	2981	49 38 9	2975
18	Fomalhaut	W.	59 34 49	3211	61 0 45	3186	62 27 11	3163	63 54 5	3139
	Saturn	W.	43 57 57	2805	45 32 18	2792	47 6 57	2779	48 41 53	2766
	Mars	W.	38 10 35	2956	39 41 43	2943	41 13 7	2930	42 44 48	2916
	α Pegasi	W.	37 36 32	3353	38 59 42	3304	40 23 49	3258	41 48 50	3215
	Aldebaran	E.	42 3 31	2956	40 32 23	2954	39 1 13	2955	37 30 4	2957
	Pollux	E.	83 56 41	2796	82 22 8	2785	80 47 20	2772	79 12 16	2760
19	Fomalhaut	W.	71 15 15	3036	72 44 43	3018	74 14 33	3001	75 44 45	2984
	Saturn	W.	56 40 46	2701	58 17 24	2689	59 54 18	2677	61 31 29	2664
	Mars	W.	50 27 30	2850	52 0 53	2838	53 34 32	2825	55 8 28	2811
	α Pegasi	W.	49 5 26	3043	50 34 45	3014	52 4 40	2988	53 35 8	2962
	Pollux	E.	71 12 50	2698	69 36 8	2687	67 59 10	2675	66 21 56	2663
	Regulus	E.	108 5 46	2688	106 28 50	2676	104 51 38	2663	103 14 9	2652
20	Fomalhaut	W.	83 20 45	2909	84 52 52	2896	86 25 16	2884	87 57 55	2873
	Saturn	W.	69 41 33	2604	71 20 22	2593	72 59 27	2582	74 38 47	2571
	Mars	W.	63 2 14	2750	64 37 47	2738	66 13 36	2727	67 49 40	2716

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Sun	W.	100° 54′ 25″	3476	102° 15′ 16″	3474	103° 36′ 9″	3472	104° 57′ 4″	3471
	Jupiter	W.	59 7 49	3159	60 34 47	3157	62 1 48	3155	63 28 51	3153
	Venus	W.	55 40 0	3506	57 0 17	3505	58 20 36	3503	59 40 57	3501
	α Aquilæ	W.	42 25 3	5012	43 21 49	4905	44 20 0	4805	45 19 32	4715
	α Arietis	E.	63 38 53	3093	62 10 35	3092	60 42 16	3091	59 13 56	3090
14	Sun	W.	111 42 23	3453	113 3 40	3448	114 25 2	3443	115 46 30	3438
	Jupiter	W.	70 45 2	3133	72 12 31	3128	73 40 7	3123	75 7 49	3117
	Venus	W.	66 23 34	3480	67 44 20	3474	69 5 13	3469	70 26 12	3462
	α Aquilæ	W.	50 34 40	4352	51 40 45	4293	52 47 44	4239	53 55 33	4188
	α Arietis	E.	51 51 42	3078	50 23 5	3074	48 54 24	3070	47 25 38	3066
	Aldebaran	E.	83 47 0	3121	82 19 16	3116	80 51 26	3112	79 23 31	3107
15	Sun	W.	122 35 36	3402	123 57 50	3395	125 20 12	3387	126 42 43	3378
	Jupiter	W.	82 28 16	3082	83 56 48	3073	85 25 30	3065	86 54 23	3056
	Venus	W.	77 13 8	3423	78 34 58	3414	79 56 59	3405	81 19 10	3395
	α Aquilæ	W.	59 45 55	3973	60 58 1	3937	62 10 43	3903	63 24 0	3869
	α Arietis	E.	40 0 29	3043	38 31 10	3039	37 1 45	3034	35 32 14	3030
	Aldebaran	E.	72 2 17	3078	70 33 40	3071	69 4 55	3065	67 36 2	3058
16	Sun	W.	133 37 55	3332	135 1 29	3322	136 25 15	3313	137 49 12	3303
	Jupiter	W.	94 21 37	3008	95 51 40	2997	97 21 57	2986	98 52 27	2975
	Venus	W.	88 12 59	3341	89 36 23	3330	91 0 0	3318	92 23 51	3306
	α Aquilæ	W.	69 38 25	3725	70 54 46	3700	72 11 33	3676	73 28 46	3653
	Saturn	W.	25 27 56	2967	26 58 50	2953	28 30 2	2939	30 1 32	2925
	Aldebaran	E.	60 9 28	3022	58 39 43	3015	57 9 49	3008	55 39 46	3001
17	Jupiter	W.	106 28 27	2918	108 0 23	2906	109 32 34	2894	111 5 0	2882
	Venus	W.	99 26 39	3242	100 51 58	3229	102 17 33	3216	103 43 23	3202
	α Aquilæ	W.	80 0 44	3550	81 20 13	3532	82 40 2	3515	84 0 10	3499
	Fomalhaut	W.	53 56 26	3323	55 20 11	3293	56 44 31	3265	58 9 24	3237
	Saturn	W.	37 43 22	2857	39 16 36	2845	40 50 6	2831	42 23 53	2818
	α Pegasi	W.	32 15 8	3606	33 33 36	3533	34 53 24	3468	36 14 24	3408
	Mars	W.	32 8 54	3011	33 38 53	2997	35 9 10	2983	36 39 44	2969
	Aldebaran	E.	48 7 25	2969	46 36 34	2965	45 5 38	2962	43 34 37	2958
18	Fomalhaut	W.	65 21 27	3117	66 49 16	3096	68 17 31	3075	69 46 11	3056
	Saturn	W.	50 17 5	2753	51 52 34	2740	53 28 21	2727	55 4 25	2714
	Mars	W.	44 16 47	2903	45 49 2	2889	47 21 35	2876	48 54 24	2863
	α Pegasi	W.	43 14 41	3176	44 41 19	3140	46 8 40	3105	47 36 43	3073
	Aldebaran	E.	35 58 57	2961	34 27 55	2968	32 57 2	2977	31 26 21	2990
	Pollux	E.	77 36 55	2747	76 1 18	2735	74 25 25	2723	72 49 16	2710
19	Fomalhaut	W.	77 15 18	2968	78 46 11	2952	80 17 24	2938	81 48 55	2923
	Saturn	W.	63 8 57	2652	64 46 42	2640	66 24 43	2628	68 3 0	2616
	Mars	W.	56 42 41	2799	58 17 10	2787	59 51 55	2775	61 26 56	2762
	α Pegasi	W.	55 6 9	2938	56 37 40	2915	58 9 40	2893	59 42 8	2873
	Pollux	E.	64 44 27	2651	63 6 41	2640	61 28 40	2629	59 50 24	2617
	Regulus	E.	101 36 24	2640	99 58 23	2628	98 20 6	2616	96 41 33	2604
20	Fomalhaut	W.	89 30 49	2862	91 3 57	2851	92 37 19	2842	94 10 53	2833
	Saturn	W.	76 18 22	2560	77 58 12	2548	79 38 18	2538	81 18 38	2528
	Mars	W.	69 25 59	2704	71 2 33	2693	72 39 22	2683	74 16 25	2672

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	α Pegasi	W.	61° 15′ 2″	2852	62° 48′ 22″	2833	64° 22′ 7″	2815	65° 56′ 15″	2798
	Pollux	E.	58 11 52	2606	56 33 5	2595	54 54 3	2585	53 14 47	2574
	Regulus	E.	95 2 44	2593	93 23 39	2582	91 44 19	2570	90 4 43	2559
21	Fomalhaut	W.	95 44 38	2825	97 18 34	2818	98 52 39	2811	100 26 52	2805
	Saturn	W.	82 59 12	2518	84 40 0	2509	86 21 1	2499	88 2 16	2489
	Mars	W.	75 53 42	2662	77 31 13	2652	79 8 57	2642	80 46 55	2633
	α Pegasi	W.	73 52 19	2722	75 28 30	2709	77 4 58	2696	78 41 43	2684
	α Arietis	W.	30 35 23	2575	32 14 52	2560	33 54 42	2545	35 34 53	2531
	Pollux	E.	44 54 58	2527	43 14 22	2518	41 33 34	2510	39 52 34	2502
	Regulus	E.	81 43 1	2507	80 1 57	2497	78 20 40	2487	76 39 9	2479
22	α Arietis	W.	44 0 17	2472	45 42 9	2462	47 24 15	2453	49 6 34	2444
	Pollux	E.	31 25 10	2472	29 43 18	2469	28 1 21	2466	26 19 20	2465
	Regulus	E.	68 8 27	2436	66 25 43	2428	64 42 48	2420	62 59 42	2413
23	α Arietis	W.	57 41 8	2405	59 24 35	2399	61 8 11	2393	62 51 56	2387
	Aldebaran	W.	27 23 40	2722	28 59 50	2681	30 36 55	2646	32 14 48	2615
	Regulus	E.	54 21 46	2381	52 37 44	2375	50 53 33	2370	49 9 15	2364
	Spica	E.	108 23 40	2384	106 39 42	2378	104 55 35	2373	103 11 21	2367
24	α Arietis	W.	71 32 41	2362	73 17 11	2358	75 1 46	2354	76 46 27	2350
	Aldebaran	W.	40 33 4	2510	42 14 4	2495	43 55 24	2482	45 37 3	2470
	Regulus	E.	40 25 59	2343	38 41 2	2339	36 55 59	2335	35 10 51	2332
	Spica	E.	94 28 23	2345	92 43 29	2341	90 58 29	2337	89 13 24	2334
	Sun	E.	134 30 37	2701	132 53 58	2695	131 17 12	2690	129 40 19	2685
25	α Arietis	W.	85 31 6	2335	87 16 14	2333	89 1 25	2331	90 46 39	2330
	Aldebaran	W.	54 8 58	2426	55 51 56	2419	57 35 4	2413	59 18 20	2408
	Spica	E.	80 26 53	2321	78 41 24	2318	76 55 51	2316	75 10 15	2315
	Sun	E.	121 34 23	2666	119 56 57	2663	118 19 26	2660	116 41 52	2657
26	Aldebaran	W.	67 56 24	2387	69 40 17	2384	71 24 14	2382	73 8 14	2380
	Pollux	W.	24 54 22	2355	26 39 1	2348	28 23 50	2343	30 8 47	2338
	Spica	E.	66 21 42	2308	64 35 54	2307	62 50 5	2307	61 4 15	2306
	Sun	E.	108 33 13	2647	106 55 22	2646	105 17 29	2645	103 39 35	2643
27	Aldebaran	W.	81 48 55	2373	83 33 8	2373	85 17 22	2373	87 1 36	2372
	Pollux	W.	38 54 57	2324	40 40 22	2322	42 25 50	2320	44 11 20	2320
	Spica	E.	52 14 56	2305	50 29 4	2305	48 43 12	2306	46 57 21	2306
	Sun	E.	95 29 46	2640	93 51 46	2641	92 13 47	2641	90 35 48	2641
28	Pollux	W.	52 59 4	2317	54 44 38	2317	56 30 12	2318	58 15 45	2319
	Spica	E.	38 8 20	2311	36 22 37	2313	34 36 56	2315	32 51 18	2316
	Sun	E.	82 25 58	2644	80 48 3	2645	79 10 9	2646	77 32 17	2648
29	Pollux	W.	67 3 11	2324	68 48 35	2326	70 33 57	2328	72 19 16	2330
	Regulus	W.	30 4 33	2314	31 50 12	2316	33 35 48	2318	35 21 21	2320
	Sun	E.	69 23 30	2657	67 45 52	2660	66 8 18	2663	64 30 48	2665
30	Pollux	W.	81 5 3	2342	82 50 1	2345	84 34 55	2348	86 19 44	2353
	Regulus	W.	44 8 17	2333	45 53 29	2336	47 38 36	2339	49 23 38	2343
	Sun	E.	56 24 18	2683	54 47 15	2687	53 10 18	2692	51 33 27	2696

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L of Diff.	XVIIIh.	P. L. of Diff	XXIh.	P. L. of Diff.
20	α Pegasi	W.	67° 30′ 46″	2781	69° 5′ 39″	2765	70° 40′ 53″	2750	72° 16′ 27″	2736
	Pollux	E.	51 35 16	2564	49 55 31	2554	48 15 33	2545	46 35 22	2536
	Regulus	E.	88 24 52	2548	86 44 46	2538	85 4 26	2527	83 23 51	2517
21	Fomalhaut	W.	102 1 13	2801	103 35 40	2797	105 10 12	2794	106 44 48	2792
	Saturn	W.	89 43 44	2481	91 25 24	2472	93 7 17	2463	94 49 22	2455
	Mars	W.	82 25 5	2624	84 3 28	2615	85 42 3	2606	87 20 50	2597
	α Pegasi	W.	80 18 44	2673	81 56 0	2663	83 33 30	2653	85 11 13	2643
	α Arietis	W.	37 15 23	2518	38 56 11	2505	40 37 17	2494	42 18 39	2482
	Pollux	E.	38 11 24	2495	36 30 4	2488	34 48 34	2482	33 6 56	2477
	Regulus	E.	74 57 26	2470	73 15 30	2460	71 33 21	2452	69 51 0	2443
22	α Arietis	W.	50 49 6	2436	52 31 50	2428	54 14 45	2420	55 57 51	2412
	Pollux	E.	24 37 18	2465	22 55 16	2468	21 13 18	2473	19 31 27	2481
	Regulus	E.	61 16 26	2406	59 33 0	2400	57 49 25	2393	56 5 40	2387
23	α Arietis	W.	64 35 50	2381	66 19 52	2376	68 4 1	2371	69 48 18	2366
	Aldebaran	W.	33 53 22	2588	35 32 33	2565	37 12 16	2545	38 52 27	2526
	Regulus	E.	47 24 49	2359	45 40 16	2355	43 55 37	2350	42 10 51	2346
	Spica	E.	101 26 59	2362	99 42 30	2357	97 57 54	2353	96 13 12	2348
24	α Arietis	W.	78 31 14	2346	80 16 6	2344	82 1 2	2341	83 46 2	2338
	Aldebaran	W.	47 18 58	2459	49 1 9	2450	50 43 33	2441	52 26 10	2433
	Regulus	E.	33 25 38	2399	31 40 21	2396	29 54 59	2394	28 9 34	2391
	Spica	E.	87 28 14	2331	85 43 0	2328	83 57 41	2326	82 12 19	2323
	Sun	E.	128 3 19	2681	126 26 13	2677	124 49 2	2672	123 11 45	2669
25	α Arietis	W.	92 31 55	2398	94 17 14	2396	96 2 35	2395	97 47 58	2394
	Aldebaran	W.	61 1 44	2403	62 45 15	2398	64 28 52	2394	66 12 35	2390
	Spica	E.	73 24 37	2313	71 38 56	2311	69 53 13	2310	68 7 28	2309
	Sun	E.	115 4 14	2655	113 26 33	2652	111 48 49	2650	110 11 2	2649
26	Aldebaran	W.	74 52 18	2378	76 36 24	2376	78 20 33	2375	80 4 43	2374
	Pollux	W.	31 53 51	2334	33 39 1	2331	35 24 16	2328	37 9 35	2326
	Spica	E.	59 18 24	2306	57 32 33	2305	55 46 41	2305	54 0 49	2304
	Sun	E.	102 1 39	2643	100 23 42	2642	98 45 44	2641	97 7 45	2641
27	Aldebaran	W.	88 45 51	2373	90 30 5	2373	92 14 19	2374	93 58 31	2375
	Pollux	W.	45 56 51	2319	47 42 23	2318	49 27 56	2317	51 13 30	2317
	Spica	E.	45 11 30	2307	43 25 40	2308	41 39 52	2309	39 54 5	2310
	Sun	E.	88 57 49	2641	87 19 50	2642	85 41 52	2643	84 3 55	2643
28	Pollux	W.	60 1 17	2320	61 46 48	2321	63 32 17	2322	65 17 45	2323
	Spica	E.	31 5 42	2319	29 20 10	2322	27 34 42	2326	25 49 19	2329
	Sun	E.	75 54 27	2649	74 16 39	2651	72 38 53	2653	71 1 10	2655
29	Pollux	W.	74 4 32	2332	75 49 45	2334	77 34 55	2337	79 20 1	2339
	Regulus	W.	37 6 51	2322	38 52 18	2325	40 37 41	2327	42 23 1	2330
	Sun	E.	62 53 21	2668	61 15 58	2672	59 38 40	2675	58 1 26	2679
30	Pollux	W.	88 4 27	2356	89 49 5	2359	91 33 38	2364	93 18 5	2368
	Regulus	W.	51 8 35	2347	52 53 26	2350	54 38 12	2355	56 22 52	2359
	Sun	E.	49 56 42	2701	48 20 4	2707	46 43 34	2713	45 7 12	2719

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, *to be subtracted from* *added to* *Apparent Time.*	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	16 31 4.31	10.813	S. 21 53 1.8	−22.92	16 16.05	70.34	10 41.28	0.955
Sun.	2	16 35 24.18	10.841	22 1 59.7	21.87	16 16.19	70.42	10 18.03	0.982
Mon.	3	16 39 44.67	10.866	22 10 31.9	20.80	16 16.33	70.50	9 54.17	1.007
Tues.	4	16 44 5.75	10.890	22 18 38.3	19.72	16 16.46	70.58	9 29.71	1.031
Wed.	5	16 48 27.40	10.913	22 26 18.7	18.63	16 16.59	70.66	9 4.69	1.054
Thur.	6	16 52 49.60	10.935	22 33 32.7	17.53	16 16.72	70.73	8 39.12	1.076
Frid.	7	16 57 12.32	10.955	22 40 20.3	16.42	16 16.85	70.80	8 13.03	1.096
Sat.	8	17 1 35.52	10.975	22 46 41.1	15.30	16 16.97	70.86	7 46.45	1.116
Sun.	9	17 5 59.16	10.992	22 52 34.8	14.17	16 17.09	70.92	7 19.45	1.133
Mon.	10	17 10 23.21	11.009	22 58 1.4	13.04	16 17.21	70.98	6 52.04	1.150
Tues.	11	17 14 47.64	11.024	23 3 0.8	11.90	16 17.32	71.03	6 24.25	1.165
Wed.	12	17 19 12.42	11.039	23 7 32.7	10.76	16 17.43	71.08	5 56.14	1.180
Thur.	13	17 23 37.50	11.051	23 11 37.1	9.61	16 17.53	71.12	5 27.64	1.192
Frid.	14	17 28 2.88	11.063	23 15 13.7	8.45	16 17.63	71.16	4 58.88	1.204
Sat.	15	17 32 28.52	11.073	23 18 22.2	7.29	16 17.72	71.19	4 29.89	1.214
Sun.	16	17 36 54.39	11.081	23 21 3.0	6.12	16 17.81	71.22	4 0.67	1.222
Mon.	17	17 41 20.45	11.089	23 23 15.7	4.94	16 17.89	71.25	3 31.25	1.229
Tues.	18	17 45 46.66	11.095	23 25 0.3	3.77	16 17.97	71.27	3 1.67	1.235
Wed.	19	17 50 13.00	11.099	23 26 16.7	2.60	16 18.04	71.29	2 31.97	1.239
Thur.	20	17 54 39.45	11.103	23 27 5.0	1.42	16 18.10	71.30	2 2.17	1.243
Frid.	21	17 59 5.97	11.105	23 27 25.0	− 0.24	16 18.16	71.31	1 32.29	1.245
Sat.	22	18 3 32.53	11.107	23 27 16.6	+ 0.94	16 18.21	71.31	1 2.37	1.247
Sun.	23	18 7 59.10	11.106	23 26 39.9	2.12	16 18.25	71.31	0 32.43	1.246
Mon.	24	18 12 25.66	11.105	23 25 35 0	3.29	16 18.29	71.30	0 2.51	1.245
Tues.	25	18 16 52.17	11.102	23 24 1.8	4.47	16 18.32	71.29	0 27.35	1.242
Wed.	26	18 21 18.59	11.098	23 22 0.5	5.64	16 18.35	71.27	0 57.13	1.238
Thur.	27	18 25 44.90	11.092	23 19 30.9	6.82	16 18.37	71.25	1 26.80	1.232
Frid.	28	18 30 11.06	11.086	23 16 33.0	7.99	16 18.38	71.23	1 56.32	1.226
Sat.	29	18 34 37.04	11.078	23 13 7.1	9.16	16 18.39	71.20	2 25.66	1.218
Sun.	30	18 39 2.80	11.069	23 9 13.2	10.32	16 18.40	71.17	2 54.79	1.209
Mon.	31	18 43 28.31	11.058	23 4 51.5	11.49	16 18.40	71.14	3 23.65	1.198
Tues.	32	18 47 53.54	11.046	S. 23 0 2.0	+12.64	16 18.40	71.10	3 52.25	1.186

Note.—Mean Time of the Semidiameter passing may be found by subtracting $0^s.19$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that south declinations are increasing; + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S *Apparent* Right Ascension.	Diff. for 1 hour.	*Apparent* Declination.	Diff. for 1 hour.	Equation of Time, *to be added to* / *subtracted from* *Mean Time.*	Diff. for 1 hour.	Sidereal Time or Right Ascension of *Mean Sun.*
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	16 31 6.25	10.811	S. 21 53 6.0	−22.91	10 41.11	0.958	16 41 47.36
Sun.	2	16 35 26.06	10.838	22 2 3.5	21.86	10 17.86	0.982	16 45 43.92
Mon.	3	16 39 46.48	10.863	22 10 35.4	20.79	9 54.00	1.007	16 49 40.48
Tues.	4	16 44 7.49	10.887	22 18 41.5	19.71	9 29.55	1.031	16 53 37.04
Wed.	5	16 48 29.07	10.910	22 26 21.6	18.62	9 4.53	1.054	16 57 33.60
Thur.	6	16 52 51.20	10.932	22 33 35.3	17.52	8 38.95	1.076	17 1 30.15
Frid.	7	16 57 13.83	10.952	22 40 22.6	16.41	8 12.88	1.096	17 5 26.71
Sat.	8	17 1 36.96	10.972	22 46 43.1	15.29	7 46.31	1.116	17 9 23.27
Sun.	9	17 6 0.52	10.989	22 52 36.6	14.16	7 19.31	1.133	17 13 19.83
Mon.	10	17 10 24.49	11.006	22 58 3.0	13.03	6 51.90	1.150	17 17 16.39
Tues.	11	17 14 48.83	11.021	23 3 2.1	11.89	6 24.12	1.165	17 21 12.95
Wed.	12	17 19 13.53	11.036	23 7 33.8	10.75	5 55.97	1.180	17 25 9.50
Thur.	13	17 23 38.53	11.048	23 11 38.0	9.60	5 27.53	1.192	17 29 6.06
Frid.	14	17 28 3.83	11.060	23 15 14.4	8.44	4 58.79	1.204	17 33 2.62
Sat.	15	17 32 29.38	11.070	23 18 22.8	7.28	4 29.80	1.214	17 36 59.18
Sun.	16	17 36 55.16	11.078	23 21 3.4	6.11	4 0.58	1.222	17 40 55.74
Mon.	17	17 41 21.13	11.085	23 23 16.0	4.94	3 31.17	1.229	17 44 52.30
Tues.	18	17 45 47.25	11.091	23 25 0.5	3.77	3 1.60	1.235	17 48 48.85
Wed.	19	17 50 13.49	11.095	23 26 16.9	2.60	2 31.92	1.239	17 52 45.41
Thur.	20	17 54 39.85	11.099	23 27 5.1	1.42	2 2.12	1.243	17 56 41.97
Frid.	21	17 59 6.28	11.101	23 27 25.0	− 0.24	1 32.25	1.245	18 0 38.53
Sat.	22	18 3 32.75	11.103	23 27 16.6	+ 0.94	1 2.34	1.247	18 4 35.09
Sun.	23	18 7 59.23	11.102	23 26 39.9	2.12	0 32.42	1.246	18 8 31.65
Mon.	24	18 12 25.70	11.101	23 25 35.0	3.29	0 2.51	1.245	18 12 28.21
Tues.	25	18 16 52.11	11.098	23 24 1.9	4.47	0 27.34	1.242	18 16 24.77
Wed.	26	18 21 18.44	11.094	23 22 0.6	5.64	0 57.11	1.238	18 20 21.33
Thur.	27	18 25 44.66	11.088	23 19 31.0	6.82	1 26.77	1.232	18 24 17.89
Frid.	28	18 30 10.73	11.082	23 16 33.3	7.99	1 56.28	1.226	18 28 14.45
Sat.	29	18 34 36.62	11.074	23 13 7.5	9.16	2 25.61	1.218	18 32 11.01
Sun.	30	18 39 2.29	11.065	23 9 13.7	10.32	2 54.73	1.209	18 36 7.56
Mon.	31	18 43 27.71	11.054	23 4 52.1	11.48	3 23.59	1.198	18 40 4.12
Tues.	32	18 47 52.85	11.042	S. 23 0 2.8	+12.63	3 52.17	1.186	18 44 0.68

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. +9ˢ.8565

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True LONGITUDE. λ	THE SUN'S True LONGITUDE. λ′	Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal 0h.
		° ′ ″	′ ″	″	″			h m s
1	335	249 27 32.8	26 38.1	152.22	−0.94	9.9937056	−26.7	7 17 0.83
2	336	250 28 26.7	27 31.8	152.27	1.01	.9936422	26.1	7 13 4.92
3	337	251 29 21.9	28 26.8	152.32	1.03	.9935802	25.5	7 9 9.01
4	338	252 30 18.3	29 23.0	152.37	1.04	.9935197	24.9	7 5 13.10
5	339	253 31 15.7	30 20.2	152.42	1.00	.9934605	24.3	7 1 17.20
6	340	254 32 14.2	31 18.5	152.46	0.95	.9934027	23.8	6 57 21.29
7	341	255 33 13.7	32 17.8	152.49	0.86	.9933463	23.2	6 53 25.38
8	342	256 34 13.9	33 17.9	152.52	0.76	.9932914	22.5	6 49 29.46
9	343	257 35 14.7	34 18.5	152.55	0.64	.9932381	21.8	6 45 33.54
10	344	258 36 16.1	35 19.7	152.57	0.51	.9931865	21.1	6 41 37.63
11	345	259 37 18.1	36 21.5	152.59	0.37	.9931368	20.3	6 37 41.72
12	346	260 38 20.6	37 23.8	152.61	0.24	.9930890	19.4	6 33 45.81
13	347	261 39 23.6	38 26.6	152.63	0.13	.9930433	18.6	6 29 49.90
14	348	262 40 27.0	39 29.8	152.65	−0.02	.9929998	17.7	6 25 53.99
15	349	263 41 30.8	40 33.4	152.67	+0.05	.9929586	16.7	6 21 58.08
16	350	264 42 35.0	41 37.4	152.68	0.10	.9929199	15.6	6 18 2.16
17	351	265 43 39.6	42 41.8	152.70	0.10	.9928838	14.5	6 14 6.25
18	352	266 44 44.5	43 46.6	152.71	0.10	.9928505	13.3	6 10 10.34
19	353	267 45 49.8	44 51.7	152.73	+0.04	.9928199	12.2	6 6 14.43
20	354	268 46 55.5	45 57.2	152.75	−0.02	.9927921	11.0	6 2 18.51
21	355	269 48 1.7	47 3.2	152.77	0.12	.9927671	9.9	5 58 22.59
22	356	270 49 8.5	48 9.8	152.79	0.22	.9927449	8.7	5 54 26.68
23	357	271 50 15.8	49 16.9	152.81	0.35	.9927254	7.6	5 50 30.77
24	358	272 51 23.7	50 24.6	152.84	0.48	.9927086	6.5	5 46 34.85
25	359	273 52 32.1	51 32.8	152.86	0.62	.9926944	5.4	5 42 38.94
26	360	274 53 41.0	52 41.5	152.88	0.73	.9926828	4.3	5 38 43.03
27	361	275 54 50.3	53 50.6	152.90	0.83	.9926737	3.3	5 34 47.12
28	362	276 56 0.1	55 0.2	152.92	0.92	.9926668	2.4	5 30 51.20
29	363	277 57 10.4	56 10.3	152.94	0.97	.9926620	1.5	5 26 55.29
30	364	278 58 21.1	57 20.8	152.95	1.01	.9926593	− 0.7	5 22 59.38
31	365	279 59 32.1	58 31.6	152.96	1.01	.9926585	0.0	5 19 3.47
32	366	280 60 43.3	59 42.6	152.97	−0.97	9.9926595	+ 0.8	5 15 7.55

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9^{s}.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 0.9	15 58.3	58 40.1	−0.76	58 30.3	−0.88	21 33.0	2.19	26.1
2	15 55.2	15 51.8	58 19.1	0.99	58 6.5	1.11	22 27.0	2.31	27.1
3	15 48.0	15 43.9	57 52.6	1.21	57 37.5	1.30	23 23.4	2.39	28.1
4	15 39.5	15 34.9	57 21.4	1.38	57 4.5	1.44	☌		29.1
5	15 30.1	15 25.2	56 46.9	1.48	56 29.0	1.50	0 20.9	2.39	0.6
6	15 20.3	15 15.5	56 11.0	1.49	55 53.3	1.46	1 17.5	2.31	1.6
7	15 10.8	15 6.5	55 36.2	1.39	55 20.0	1.30	2 11.4	2.17	2.6
8	15 2.4	14 58.7	55 5.0	1.20	54 51.4	1.06	3 1.6	2.00	3.6
9	14 55.5	14 52.8	54 39.6	0.91	54 29.8	0.73	3 47.9	1.85	4.6
10	14 50.7	14 49.2	54 22.1	0.54	54 16.7	0.37	4 30.9	1.73	5.6
11	14 48.4	14 48.3	54 13.8	−0.14	54 13.5	+0.08	5 11.5	1.66	6.6
12	14 49.0	14 50.3	54 15.7	+0.30	54 20.6	−0.52	5 50.8	1.63	7.6
13	14 52.4	14 55.1	54 28.2	0.74	54 38.4	0.95	6 30.1	1.65	8.6
14	14 58.6	15 2.7	54 51.0	1.15	55 6.0	1.34	7 10.6	1.73	9.6
15	15 7.3	15 12.5	55 23.1	1.51	55 42.1	1.65	7 53.4	1.85	10.6
16	15 18.0	15 24.0	56 2.7	1.78	56 24.6	1.87	8 39.8	2.03	11.6
17	15 30.3	15 36.6	56 47.4	1.93	57 10.7	1.94	9 30.9	2.24	12.6
18	15 42.9	15 49.0	57 33.9	1.92	57 56.6	1.86	10 26.9	2.44	13.6
19	15 55.0	16 0.5	58 18.3	1.76	58 38.6	1.62	11 27.1	2.57	14.6
20	16 5.5	16 10.0	58 57.0	1.44	59 13.2	1.24	12 29.3	2.59	15.6
21	16 13.7	16 16.6	59 26.8	1.02	59 37.5	0.78	13 30.7	2.50	16.6
22	16 18.7	16 20.0	59 45.4	0.53	59 50.2	+0.28	14 29.1	2.35	17.6
23	16 20.6	16 20.3	59 52.2	+0.05	59 51.4	−0.17	15 23.6	2.19	18.6
24	16 19.5	16 18.0	59 48.1	−0.37	59 42.5	0.55	16 14.7	2.06	19.6
25	16 15.9	16 13.4	59 35.0	0.70	59 25.8	0.82	17 3.4	2.00	20.6
26	16 10.5	16 7.4	59 15.3	0.92	59 3.8	1.00	17 51.0	1.98	21.6
27	16 4.0	16 0.5	58 51.4	1.06	58 38.4	1.10	18 39.0	2.03	22.6
28	15 56.8	15 53.1	58 25.0	1.13	58 11.3	1.16	19 28.6	2.11	23.6
29	15 49.3	15 45.4	57 57.3	1.17	57 43.2	1.19	20 20.5	2.22	24.6
30	15 41.5	15 37.6	57 28.9	1.19	57 14.6	1.20	21 14.9	2.31	25.6
31	15 33.7	15 29.8	57 0.2	1.20	56 45.7	1.21	22 11.1	2.35	26.6
32	15 25.8	15 21.9	56 31.2	−1.21	56 16.7	−1.20	23 7.4	2.34	27.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 30 18.76	2.1862	S. 14 9 19.9	14.238
1	13 32 30.04	2.1900	14 23 31.8	14.158
2	13 34 41.56	2.1939	14 37 38.9	14.077
3	13 36 53.31	2.1978	14 51 41.1	13.994
4	13 39 5.30	2.2018	15 5 38.2	13.909
5	13 41 17.53	2.2058	15 19 30.2	13.823
6	13 43 30.00	2.2099	15 33 17.0	13.736
7	13 45 42.72	2.2140	15 46 58.5	13.647
8	13 47 55.68	2.2181	16 0 34.6	13.557
9	13 50 8.89	2.2223	16 14 5.3	13.465
10	13 52 22.35	2.2265	16 27 30.4	13.372
11	13 54 36.07	2.2307	16 40 49.9	13.277
12	13 56 50.04	2.2350	16 54 3.6	13.180
13	13 59 4.27	2.2393	17 7 11.5	13.082
14	14 1 18.76	2.2436	17 20 13.5	12.984
15	14 3 33.50	2.2479	17 33 9.6	12.884
16	14 5 48.50	2.2523	17 45 59.6	12.782
17	14 8 3.77	2.2567	17 58 43.5	12.679
18	14 10 19.30	2.2610	18 11 21.1	12.574
19	14 12 35.09	2.2654	18 23 52.4	12.468
20	14 14 51.15	2.2699	18 36 17.3	12.361
21	14 17 7.48	2.2744	18 48 35.7	12.252
22	14 19 24.08	2.2788	19 0 47.5	12.142
23	14 21 40.94	2.2832	S. 19 12 52.7	12.030

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 23 58.07	2.2877	S. 19 24 51.1	11.917
1	14 26 15.47	2.2922	19 36 42.7	11.803
2	14 28 33.14	2.2967	19 48 27.4	11.688
3	14 30 51.07	2.3011	20 0 5.2	11.571
4	14 33 9.27	2.3056	20 11 35.9	11.452
5	14 35 27.74	2.3100	20 22 59.4	11.332
6	14 37 46.47	2.3144	20 34 15.7	11.211
7	14 40 5.47	2.3189	20 45 24.7	11.088
8	14 42 24.74	2.3233	20 56 26.3	10.965
9	14 44 44.27	2.3278	21 7 20.5	10.840
10	14 47 4.07	2.3322	21 18 7.1	10.713
11	14 49 24.13	2.3365	21 28 46.1	10.586
12	14 51 44.45	2.3408	21 39 17.4	10.457
13	14 54 5.03	2.3452	21 49 41.0	10.327
14	14 56 25.87	2.3495	21 59 56.7	10.196
15	14 58 46.97	2.3537	22 10 4.5	10.064
16	15 1 8.32	2.3579	22 20 4.3	9.930
17	15 3 29.92	2.3620	22 29 56.1	9.795
18	15 5 51.76	2.3661	22 39 39.7	9.659
19	15 8 13.85	2.3702	22 49 15.1	9.522
20	15 10 36.19	2.3743	22 58 42.3	9.384
21	15 12 58.77	2.3783	23 8 1.2	9.244
22	15 15 21.59	2.3822	23 17 11.6	9.103
23	15 17 44.64	2.3862	23 26 13.6	8.962
24	15 20 7.93	2.3901	S. 23 35 7.1	8.820

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 20 7.93	2.3901	S. 23 35 7.1	8.820
1	15 22 31.45	2.3938	23 43 52.0	8.676
2	15 24 55.19	2.3975	23 52 28.2	8.531
3	15 27 19.15	2.4012	24 0 55.7	8.385
4	15 29 43.33	2.4048	24 9 14.4	8.238
5	15 32 7.72	2.4083	24 17 24.3	8.091
6	15 34 32.32	2.4118	24 25 25.3	7.942
7	15 36 57.13	2.4152	24 33 17.3	7.792
8	15 39 22.14	2.4184	24 41 0.3	7.642
9	15 41 47.34	2.4216	24 48 34.3	7.491
10	15 44 12.73	2.4247	24 55 59.2	7.338
11	15 46 38.31	2.4278	25 3 14.9	7.185
12	15 49 4.07	2.4308	25 10 21.4	7.031
13	15 51 30.01	2.4336	25 17 18.6	6.876
14	15 53 56.11	2.4364	25 24 6.5	6.721
15	15 56 22.38	2.4392	25 30 45.1	6.565
16	15 58 48.81	2.4418	25 37 14.3	6.408
17	16 1 15.40	2.4443	25 43 34.0	6.250
18	16 3 42.13	2.4467	25 49 44.3	6.092
19	16 6 9.00	2.4490	25 55 45.0	5.933
20	16 8 36.01	2.4512	26 1 36.2	5.773
21	16 11 3.15	2.4533	26 7 17.8	5.612
22	16 13 30.41	2.4552	26 12 49.7	5.452
23	16 15 57.78	2.4571	S. 26 18 12.0	5.291

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 18 25.26	2.4588	S. 26 23 24.6	5.129
1	16 20 52.84	2.4605	26 28 27.5	4.967
2	16 23 20.52	2.4621	26 33 20.6	4.803
3	16 25 48.29	2.4635	26 38 3.9	4.640
4	16 28 16.14	2.4648	26 42 37.4	4.477
5	16 30 44.07	2.4660	26 47 1.1	4.313
6	16 33 12.06	2.4670	26 51 15.0	4.149
7	16 35 40.11	2.4680	26 55 19.0	3.984
8	16 38 8.22	2.4688	26 59 13.1	3.819
9	16 40 36.37	2.4694	27 2 57.3	3.654
10	16 43 4.55	2.4700	27 6 31.6	3.489
11	16 45 32.77	2.4705	27 9 56.0	3.323
12	16 48 1.01	2.4708	27 13 10.4	3.157
13	16 50 29.27	2.4710	27 16 14.9	2.992
14	16 52 57.53	2.4710	27 19 9.5	2.827
15	16 55 25.79	2.4709	27 21 54.1	2.661
16	16 57 54.04	2.4707	27 24 28.8	2.496
17	17 0 22.28	2.4704	27 26 53.5	2.329
18	17 2 50.49	2.4699	27 29 8.2	2.163
19	17 5 18.67	2.4693	27 31 13.0	1.997
20	17 7 46.81	2.4687	27 33 7.9	1.832
21	17 10 14.91	2.4678	27 34 52.8	1.666
22	17 12 42.95	2.4668	27 36 27.8	1.501
23	17 15 10.93	2.4656	27 37 52.9	1.336
24	17 17 38.83	2.4643	S. 27 39 8.1	1.171

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 17 38.83	2.4643	S.27 39 8.1	1.171
1	17 20 6.65	2.4630	27 40 13.4	1.006
2	17 22 34.39	2.4616	27 41 8.8	0.841
3	17 25 2.04	2.4599	27 41 54.3	0.677
4	17 27 29.58	2.4581	27 42 30.0	0.513
5	17 29 57.01	2.4562	27 42 55.9	0.350
6	17 32 24.32	2.4542	27 43 12.0	0.187
7	17 34 51.51	2.4521	27 43 18.3	−0.024
8	17 37 18.57	2.4498	27 43 14.9	+0.138
9	17 39 45.48	2.4473	27 43 1.7	0.300
10	17 42 12.24	2.4448	27 42 38.9	0.461
11	17 44 38.85	2.4422	27 42 6.4	0.622
12	17 47 5.30	2.4394	27 41 24.2	0.783
13	17 49 31.58	2.4365	27 40 32.4	0.943
14	17 51 57.68	2.4334	27 39 31.1	1.102
15	17 54 23.59	2.4303	27 38 20.2	1.260
16	17 56 49.31	2.4271	27 36 59.9	1.417
17	17 59 14.84	2.4238	27 35 30.1	1.575
18	18 1 40.16	2.4203	27 33 50.9	1.732
19	18 4 5.27	2.4167	27 32 2.3	1.888
20	18 6 30.16	2.4130	27 30 4.4	2.042
21	18 8 54.83	2.4092	27 27 57.3	2.196
22	18 11 19.27	2.4052	27 25 40.9	2.350
23	18 13 43.46	2.4012	S.27 23 15.3	2.502

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 16 7.41	2.3971	S.27 20 40.6	2.654
1	18 18 31.11	2.3928	27 17 56.8	2.805
2	18 20 54.55	2.3885	27 15 4.0	2.955
3	18 23 17.73	2.3842	27 12 2.2	3.104
4	18 25 40.65	2.3798	27 8 51.5	3.252
5	18 28 3.30	2.3752	27 5 31.9	3.400
6	18 30 25.67	2.3704	27 2 3.5	3.547
7	18 32 47.75	2.3656	26 58 26.3	3.693
8	18 35 9.55	2.3608	26 54 40.4	3.837
9	18 37 31.05	2.3558	26 50 45.9	3.980
10	18 39 52.25	2.3508	26 46 42.8	4.122
11	18 42 13.15	2.3457	26 42 31.2	4.264
12	18 44 33.74	2.3406	26 38 11.1	4.405
13	18 46 54.02	2.3353	26 33 42.6	4.544
14	18 49 13.98	2.3300	26 29 5.8	4.682
15	18 51 33.62	2.3247	26 24 20.7	4.820
16	18 53 52.94	2.3193	26 19 27.4	4.957
17	18 56 11.93	2.3138	26 14 25.9	5.092
18	18 58 30.59	2.3082	26 9 16.4	5.225
19	19 0 48.91	2.3025	26 3 58.9	5.358
20	19 3 6.89	2.2969	25 58 33.4	5.491
21	19 5 24.54	2.2912	25 53 0.0	5.622
22	19 7 41.84	2.2854	25 47 18.8	5.752
23	19 9 58.79	2.2796	25 41 29.8	5.880
24	19 12 15.39	2.2737	S.25 35 33.2	6.007

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 12 15.39	2.2737	S.25 35 33.2	6.007
1	19 14 31.64	2.2678	25 29 29.0	6.133
2	19 16 47.53	2.2618	25 23 17.2	6.258
3	19 19 3.06	2.2558	25 16 58.0	6.382
4	19 21 18.23	2.2498	25 10 31.4	6.504
5	19 23 33.04	2.2438	25 3 57.5	6.626
6	19 25 47.49	2.2377	24 57 16.3	6.747
7	19 28 1.57	2.2316	24 50 27.9	6.866
8	19 30 15.28	2.2255	24 43 32.4	6.983
9	19 32 28.63	2.2194	24 36 29.9	7.100
10	19 34 41.61	2.2132	24 29 20.4	7.216
11	19 36 54.22	2.2070	24 22 4.0	7.330
12	19 39 6.45	2.2008	24 14 40.8	7.443
13	19 41 18.31	2.1946	24 7 10.8	7.555
14	19 43 29.80	2.1883	23 59 34.2	7.665
15	19 45 40.91	2.1821	23 51 51.0	7.774
16	19 47 51.65	2.1758	23 44 1.3	7.883
17	19 50 2.01	2.1696	23 36 5.0	7.992
18	19 52 12.00	2.1633	23 28 2.3	8.098
19	19 54 21.61	2.1571	23 19 53.3	8.202
20	19 56 30.85	2.1508	23 11 38.1	8.305
21	19 58 39.71	2.1445	23 3 16.7	8.407
22	20 0 48.19	2.1383	22 54 49.2	8.509
23	20 2 56.30	2.1321	S.22 46 15.6	8.609

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 5 4.04	2.1258	S.22 37 36.1	8.707
1	20 7 11.40	2.1196	22 28 50.7	8.805
2	20 9 18.39	2.1134	22 19 59.5	8.902
3	20 11 25.01	2.1072	22 11 2.5	8.998
4	20 13 31.26	2.1011	22 1 59.8	9.092
5	20 15 37.14	2.0949	21 52 51.5	9.184
6	20 17 42.65	2.0888	21 43 37.7	9.276
7	20 19 47.79	2.0827	21 34 18.4	9.367
8	20 21 52.57	2.0766	21 24 53.7	9.457
9	20 23 56.98	2.0705	21 15 23.6	9.546
10	20 26 1.03	2.0645	21 5 48.2	9.633
11	20 28 4.72	2.0585	20 56 7.6	9.719
12	20 30 8.05	2.0525	20 46 21.9	9.804
13	20 32 11.02	2.0466	20 36 31.1	9.888
14	20 34 13.64	2.0407	20 26 35.3	9.971
15	20 36 15.90	2.0348	20 16 31.6	10.053
16	20 38 17.81	2.0290	20 6 29.0	10.133
17	20 40 19.38	2.0232	19 56 18.6	10.212
18	20 42 20.60	2.0175	19 46 3.5	10.291
19	20 44 21.48	2.0117	19 35 43.7	10.368
20	20 46 22.01	2.0060	19 25 19.3	10.445
21	20 48 22.20	2.0003	19 14 50.3	10.521
22	20 50 22.05	1.9947	19 4 16.8	10.595
23	20 52 21.57	1.9892	18 53 38.9	10.668
24	20 54 20.76	1.9837	S.18 42 56.6	10.741

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	20	54	20.76	1.9837	S.	18	42	56.6	10.741
1	20	56	19.62	1.9782		18	32	10.0	10.812
2	20	58	18.15	1.9728		18	21	19.2	10.881
3	21	0	16.36	1.9675		18	10	24.3	10.950
4	21	2	14.25	1.9622		17	59	25.2	11.019
5	21	4	11.83	1.9570		17	48	22.0	11.086
6	21	6	9.09	1.9518		17	37	14.9	11.152
7	21	8	6.04	1.9466		17	26	3.8	11.218
8	21	10	2.68	1.9415		17	14	48.8	11.282
9	21	11	59.02	1.9365		17	3	30.0	11.344
10	21	13	55.06	1.9315		16	52	7.5	11.406
11	21	15	50.80	1.9266		16	40	41.2	11.468
12	21	17	46.25	1.9217		16	29	11.3	11.528
13	21	19	41.41	1.9169		16	17	37.8	11.587
14	21	21	36.28	1.9121		16	6	0.8	11.646
15	21	23	30.86	1.9073		15	54	20.3	11.704
16	21	25	25.16	1.9027		15	42	36.3	11.761
17	21	27	19.19	1.8982		15	30	49.0	11.816
18	21	29	12.95	1.8937		15	18	58.4	11.871
19	21	31	6.44	1.8893		15	7	4.5	11.925
20	21	32	59.67	1.8849		14	55	7.4	11.977
21	21	34	52.63	1.8806		14	43	7.2	12.029
22	21	36	45.34	1.8763		14	31	3.9	12.081
23	21	38	37.79	1.8721	S.	14	18	57.5	12.132

MONDAY 10.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	21	40	29.99	1.8679	S.	14	6	48.0	12.182
1	21	42	21.94	1.8638		13	54	35.0	12.231
2	21	44	13.65	1.8599		13	42	20.3	12.278
3	21	46	5.13	1.8561		13	30	2.2	12.325
4	21	47	56.38	1.8522		13	17	41.3	12.372
5	21	49	47.40	1.8484		13	5	17.6	12.417
6	21	51	38.19	1.8447		12	52	51.2	12.462
7	21	53	28.76	1.8410		12	40	22.2	12.506
8	21	55	19.11	1.8373		12	27	50.5	12.550
9	21	57	9.24	1.8337		12	15	16.2	12.592
10	21	58	59.16	1.8303		12	2	39.4	12.633
11	22	0	48.88	1.8270		11	50	0.2	12.673
12	22	2	38.40	1.8237		11	37	18.6	12.713
13	22	4	27.72	1.8204		11	24	34.6	12.753
14	22	6	16.85	1.8172		11	11	48.3	12.792
15	22	8	5.79	1.8142		10	58	59.6	12.830
16	22	9	54.55	1.8112		10	46	8.7	12.866
17	22	11	43.13	1.8082		10	33	15.7	12.902
18	22	13	31.53	1.8053		10	20	20.5	12.938
19	22	15	19.76	1.8025		10	7	23.2	12.973
20	22	17	7.83	1.7997		9	54	23.8	13.007
21	22	18	55.73	1.7970		9	41	22.4	13.040
22	22	20	43.47	1.7944		9	28	19.0	13.072
23	22	22	31.06	1.7920		9	15	13.7	13.105
24	22	24	18.51	1.7896	S.	9	2	6.4	13.137

TUESDAY 11.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	22	24	18.51	1.7896	S.	9	2	6.4	13.137
1	22	26	5.81	1.7872		8	48	57.3	13.167
2	22	27	52.97	1.7848		8	35	46.4	13.197
3	22	29	39.99	1.7826		8	22	33.7	13.226
4	22	31	26.88	1.7804		8	9	19.3	13.254
5	22	33	13.64	1.7783		7	56	3.2	13.282
6	22	35	0.28	1.7763		7	42	45.5	13.308
7	22	36	46.80	1.7744		7	29	26.2	13.335
8	22	38	33.21	1.7726		7	16	5.3	13.362
9	22	40	19.51	1.7708		7	2	42.8	13.388
10	22	42	5.70	1.7691		6	49	18.8	13.412
11	22	43	51.80	1.7675		6	35	53.4	13.434
12	22	45	37.80	1.7659		6	22	26.7	13.457
13	22	47	23.71	1.7644		6	8	53.6	13.480
14	22	49	9.53	1.7630		5	55	29.1	13.502
15	22	50	55.27	1.7617		5	41	58.3	13.523
16	22	52	40.94	1.7605		5	28	26.3	13.543
17	22	54	26.53	1.7593		5	14	53.1	13.564
18	22	56	12.05	1.7582		5	1	18.6	13.584
19	22	57	57.51	1.7572		4	47	43.0	13.602
20	22	59	42.91	1.7562		4	34	6.3	13.620
21	23	1	28.26	1.7554		4	20	28.6	13.637
22	23	3	13.56	1.7547		4	6	49.8	13.654
23	23	4	58.82	1.7539	S.	3	53	10.1	13.670

WEDNESDAY 12.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.				Diff. for 1 m.
	h	m	s	s		°	′	″	″
0	23	6	44.03	1.7532	S.	3	39	29.4	13.686
1	23	8	29.21	1.7527		3	25	47.8	13.701
2	23	10	14.36	1.7522		3	12	5.3	13.715
3	23	11	59.48	1.7518		2	58	22.0	13.728
4	23	13	44.58	1.7515		2	44	37.9	13.741
5	23	15	29.66	1.7512		2	30	53.0	13.754
6	23	17	14.73	1.7511		2	17	7.4	13.766
7	23	18	59.79	1.7510		2	3	21.1	13.777
8	23	20	44.85	1.7510		1	49	34.2	13.787
9	23	22	29.91	1.7511		1	35	46.7	13.797
10	23	24	14.98	1.7512		1	21	58.6	13.807
11	23	26	0.06	1.7515		1	8	9.9	13.816
12	23	27	45.16	1.7518		0	54	20.7	13.823
13	23	29	30.28	1.7522		0	40	31.1	13.831
14	23	31	15.42	1.7526		0	26	41.0	13.838
15	23	33	0.59	1.7532	S.	0	12	50.5	13.844
16	23	34	45.80	1.7538	N.	0	1	0.3	13.849
17	23	36	31.05	1.7545		0	14	51.3	13.853
18	23	38	16.34	1.7553		0	28	42.6	13.857
19	23	40	1.68	1.7562		0	42	34.1	13.860
20	23	41	47.08	1.7571		0	56	25.8	13.863
21	23	43	32.53	1.7581		1	10	17.7	13.866
22	23	45	18.05	1.7592		1	24	9.7	13.867
23	23	47	3.64	1.7604		1	38	1.8	13.868
24	23	48	49.30	1.7617	N.	1	51	53.9	13.868

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 48 49.30	1.7617	N. 1 51 53.9	13.868
1	23 50 35.04	1.7630	2 5 46.0	13.868
2	23 52 20.86	1.7644	2 19 38.1	13.867
3	23 54 6.77	1.7659	2 33 30.1	13.866
4	23 55 52.77	1.7675	2 47 22.0	13.863
5	23 57 38.87	1.7692	3 1 13.7	13.860
6	23 59 25.07	1.7709	3 15 5.2	13.857
7	0 1 11.38	1.7728	3 28 56.5	13.852
8	0 2 57.80	1.7747	3 42 47.5	13.847
9	0 4 44.34	1.7767	3 56 38.1	13.840
10	0 6 31.00	1.7787	4 10 28.3	13.833
11	0 8 17.78	1.7808	4 24 18.1	13.827
12	0 10 4.69	1.7830	4 38 7.5	13.819
13	0 11 51.74	1.7853	4 51 56.4	13.810
14	0 13 38.93	1.7877	5 5 44.7	13.800
15	0 15 26.27	1.7902	5 19 32.4	13.790
16	0 17 13.76	1.7928	5 33 19.5	13.780
17	0 19 1.41	1.7954	5 47 6.0	13.769
18	0 20 49.21	1.7981	6 0 51.8	13.757
19	0 22 37.18	1.8009	6 14 36.8	13.743
20	0 24 25.32	1.8038	6 28 21.0	13.729
21	0 26 13.64	1.8068	6 42 4.3	13.714
22	0 28 2.14	1.8098	6 55 46.7	13.699
23	0 29 50.82	1.8128	N. 7 9 28.2	13.683

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 31 39.68	1.8160	N. 7 23 8.7	13.667
1	0 33 28.74	1.8193	7 36 48.2	13.649
2	0 35 18.00	1.8227	7 50 26.6	13.630
3	0 37 7.47	1.8262	8 4 3.8	13.610
4	0 38 57.15	1.8297	8 17 39.8	13.590
5	0 40 47.04	1.8334	8 31 14.6	13.569
6	0 42 37.15	1.8371	8 44 48.1	13.547
7	0 44 27.49	1.8408	8 58 20.3	13.525
8	0 46 18.05	1.8447	9 11 51.1	13.502
9	0 48 8.85	1.8487	9 25 20.4	13.477
10	0 49 59.89	1.8527	9 38 48.3	13.452
11	0 51 51.17	1.8567	9 52 14.6	13.425
12	0 53 42.69	1.8609	10 5 39.3	13.397
13	0 55 34.47	1.8652	10 19 2.3	13.370
14	0 57 26.51	1.8695	10 32 23.7	13.342
15	0 59 18.81	1.8739	10 45 43.3	13.312
16	1 1 11.38	1.8784	10 59 1.1	13.281
17	1 3 4.22	1.8830	11 12 17.0	13.249
18	1 4 57.34	1.8877	11 25 31.0	13.217
19	1 6 50.74	1.8924	11 38 43.0	13.183
20	1 8 44.43	1.8972	11 51 52.9	13.148
21	1 10 38.41	1.9021	12 5 0.7	13.113
22	1 12 32.68	1.9070	12 18 6.4	13.077
23	1 14 27.25	1.9121	12 31 9.9	13.038
24	1 16 22.13	1.9172	N.12 44 11.0	12.999

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 16 22.13	1.9172	N.12 44 11.0	12.999
1	1 18 17.32	1.9224	12 57 9.8	12.960
2	1 20 12.82	1.9277	13 10 6.2	12.920
3	1 22 8.64	1.9331	13 23 0.2	12.878
4	1 24 4.79	1.9386	13 35 51.6	12.835
5	1 26 1.27	1.9441	13 48 40.4	12.791
6	1 27 58.08	1.9497	14 1 26.5	12.746
7	1 29 55.23	1.9553	14 14 9.9	12.700
8	1 31 52.72	1.9611	14 26 50.5	12.652
9	1 33 50.56	1.9669	14 39 28.2	12.604
10	1 35 48.75	1.9728	14 52 3.0	12.555
11	1 37 47.29	1.9787	15 4 34.8	12.503
12	1 39 46.19	1.9847	15 17 3.4	12.451
13	1 41 45.46	1.9908	15 29 28.9	12.398
14	1 43 45.09	1.9969	15 41 51.2	12.345
15	1 45 45.09	2.0032	15 54 10.3	12.290
16	1 47 45.47	2.0096	16 6 26.0	12.233
17	1 49 46.24	2.0160	16 18 38.3	12.175
18	1 51 47.39	2.0224	16 30 47.0	12.115
19	1 53 48.93	2.0289	16 42 52.1	12.055
20	1 55 50.86	2.0355	16 54 53.6	11.994
21	1 57 53.19	2.0422	17 6 51.4	11.932
22	1 59 55.92	2.0488	17 18 45.4	11.867
23	2 1 59.05	2.0556	N.17 30 35.4	11.801

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 4 2.59	2.0624	N.17 42 21.5	11.735
1	2 6 6.54	2.0693	17 54 3.6	11.667
2	2 8 10.91	2.0762	18 5 41.5	11.597
3	2 10 15.69	2.0832	18 17 15.2	11.526
4	2 12 20.90	2.0903	18 28 44.6	11.453
5	2 14 26.53	2.0974	18 40 9.6	11.380
6	2 16 32.59	2.1046	18 51 30.2	11.305
7	2 18 39.08	2.1118	19 2 46.2	11.228
8	2 20 46.01	2.1191	19 13 57.6	11.151
9	2 22 53.37	2.1264	19 25 4.3	11.072
10	2 25 1.17	2.1338	19 36 6.2	10.991
11	2 27 9.42	2.1412	19 47 3.2	10.907
12	2 29 18.11	2.1486	19 57 55.1	10.823
13	2 31 27.25	2.1561	20 8 42.0	10.739
14	2 33 36.84	2.1636	20 19 23.8	10.652
15	2 35 46.88	2.1712	20 30 0.3	10.564
16	2 37 57.38	2.1788	20 40 31.5	10.475
17	2 40 8.34	2.1865	20 50 57.3	10.384
18	2 42 19.76	2.1942	21 1 17.6	10.291
19	2 44 31.64	2.2018	21 11 32.2	10.197
20	2 46 43.98	2.2096	21 21 41.2	10.102
21	2 48 56.79	2.2174	21 31 44.4	10.004
22	2 51 10.07	2.2252	21 41 41.7	9.905
23	2 53 23.81	2.2330	21 51 33.0	9.804
24	2 55 38.02	2.2407	N.22 1 18.2	9.702

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 55 38.02	2.2407	N.22 1 18.2	9.702	0	4 51 51.73	2.5793	N.27 19 6.4	2.951
1	2 57 52.70	2.2486	22 10 57.3	9.599	1	4 54 26.64	2.5842	27 21 58.2	2.775
2	3 0 7.85	2.2565	22 20 30.1	9.493	2	4 57 1.84	2.5890	27 24 39.4	2.598
3	3 2 23.48	2.2644	22 29 56.5	9.387	3	4 59 37.32	2.5936	27 27 9.9	2.420
4	3 4 39.58	2.2722	22 39 16.5	9.278	4	5 2 13.07	2.5981	27 29 29.8	2.242
5	3 6 56.15	2.2801	22 48 29.9	9.168	5	5 4 49.09	2.6024	27 31 39.0	2.062
6	3 9 13.19	2.2880	22 57 36.7	9.057	6	5 7 25.36	2.6065	27 33 37.3	1.882
7	3 11 30.71	2.2959	23 6 36.8	8.944	7	5 10 1.87	2.6105	27 35 24.8	1.701
8	3 13 48.70	2.3037	23 15 30.0	8.828	8	5 12 38.62	2.6144	27 37 1.4	1.518
9	3 16 7.16	2.3116	23 24 16.2	8.712	9	5 15 15.60	2.6181	27 38 27.0	1.335
10	3 18 26.09	2.3195	23 32 55.4	8.594	10	5 17 52.79	2.6216	27 39 41.6	1.151
11	3 20 45.50	2.3274	23 41 27.5	8.474	11	5 20 30.19	2.6250	27 40 45.1	0.967
12	3 23 5.38	2.3353	23 49 52.3	8.352	12	5 23 7.79	2.6282	27 41 37.6	0.782
13	3 25 25.73	2.3431	23 58 9.8	8.230	13	5 25 45.57	2.6312	27 42 18.9	0.595
14	3 27 46.55	2.3508	24 6 19.9	8.106	14	5 28 23.53	2.6340	27 42 49.0	0.409
15	3 30 7.83	2.3586	24 14 22.5	7.980	15	5 31 1.65	2.6366	27 43 8.0	0.222
16	3 32 29.58	2.3664	24 22 17.5	7.852	16	5 33 39.92	2.6391	27 43 15.7	+0.034
17	3 34 51.80	2.3741	24 30 4.7	7.722	17	5 36 18.34	2.6414	27 43 12.1	−0.154
18	3 37 14.48	2.3818	24 37 44.1	7.591	18	5 38 56.89	2.6435	27 42 57.2	0.343
19	3 39 37.62	2.3895	24 45 15.6	7.458	19	5 41 35.56	2.6454	27 42 30.9	0.532
20	3 42 1.22	2.3971	24 52 39.1	7.323	20	5 44 14.34	2.6472	27 41 53.3	0.722
21	3 44 25.27	2.4046	24 59 54.4	7.187	21	5 46 53.23	2.6489	27 41 4.3	0.912
22	3 46 49.77	2.4121	25 7 1.5	7.050	22	5 49 32.21	2.6503	27 40 3.9	1.102
23	3 49 14.72	2.4196	N.25 14 0.4	6.912	23	5 52 11.27	2.6515	N.27 38 52.1	1.292
	TUESDAY 18.					THURSDAY 20.			
0	3 51 40.12	2.4270	N.25 20 50.9	6.771	0	5 54 50.39	2.6525	N.27 37 28.8	1.483
1	3 54 5.96	2.4343	25 27 32.9	6.628	1	5 57 29.57	2.6534	27 35 54.1	1.674
2	3 56 32.24	2.4416	25 34 6.3	6.483	2	6 0 8.80	2.6542	27 34 7.9	1.866
3	3 58 58.96	2.4489	25 40 30.9	6.338	3	6 2 48.07	2.6547	27 32 10.2	2.057
4	4 1 26.11	2.4561	25 46 46.8	6.192	4	6 5 27.36	2.6550	27 30 1.1	2.248
5	4 3 53.69	2.4632	25 52 53.9	6.043	5	6 8 6.67	2.6552	27 27 40.5	2.438
6	4 6 21.69	2.4702	25 58 52.0	5.892	6	6 10 45.98	2.6551	27 25 8.5	2.629
7	4 8 50.11	2.4771	26 4 41.0	5.741	7	6 13 25.28	2.6549	27 22 25.0	2.820
8	4 11 18.94	2.4839	26 10 20.9	5.588	8	6 16 4.57	2.6546	27 19 30.1	3.011
9	4 13 48.18	2.4907	26 15 51.6	5.433	9	6 18 43.83	2.6540	27 16 23.7	3.202
10	4 16 17.83	2.4975	26 21 12.9	5.277	10	6 21 23.05	2.6532	27 13 5.8	3.392
11	4 18 47.88	2.5041	26 26 24.8	5.120	11	6 24 2.22	2.6522	27 9 36.6	3.582
12	4 21 18.32	2.5105	26 31 27.3	4.962	12	6 26 41.32	2.6511	27 5 56.0	3.772
13	4 23 49.14	2.5168	26 36 20.2	4.801	13	6 29 20.35	2.6499	27 2 4.0	3.961
14	4 26 20.34	2.5231	26 41 3.4	4.638	14	6 31 59.31	2.6486	26 58 0.7	4.150
15	4 28 51.92	2.5293	26 45 36.8	4.475	15	6 34 38.18	2.6470	26 53 46.0	4.338
16	4 31 23.86	2.5353	26 50 0.4	4.311	16	6 37 16.95	2.6452	26 49 20.1	4.526
17	4 33 56.16	2.5412	26 54 14.1	4.146	17	6 39 55.61	2.6432	26 44 42.9	4.713
18	4 36 28.81	2.5471	26 58 17.9	3.979	18	6 42 34.14	2.6411	26 39 54.5	4.900
19	4 39 1.81	2.5528	27 2 11.6	3.810	19	6 45 12.54	2.6389	26 34 54.9	5.086
20	4 41 35.15	2.5584	27 5 55.1	3.640	20	6 47 50.81	2.6365	26 29 44.2	5.272
21	4 44 8.82	2.5638	27 9 28.4	3.469	21	6 50 28.92	2.6339	26 24 22.3	5.457
22	4 46 42.81	2.5692	27 12 51.4	3.297	22	6 53 6.87	2.6312	26 18 49.4	5.640
23	4 49 17.12	2.5743	27 16 4.1	3.125	23	6 55 44.66	2.6283	26 13 5.5	5.823
24	4 51 51.73	2.5793	N.27 19 6.4	2.951	24	6 58 22.27	2.6252	N.26 7 10.6	6.006

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
	h	m	s	s	°	′	″	″
0	6	58	22.27	2.6252	N.26	7	10.6	6.006
1	7	0	59.69	2.6221	26	1	4.8	6.187
2	7	3	36.9[illegible]	2.6188	25	54	48.1	6.367
3	7	6	13.95	2.6153	25	48	20.7	6.547
4	7	8	50.76	2.6117	25	41	42.5	6.726
5	7	11	27.35	2.6080	25	34	53.6	6.903
6	7	14	3.72	2.6042	25	27	54.1	7.079
7	7	16	39.85	2.6002	25	20	44.1	7.255
8	7	19	15.74	2.5961	25	13	23.5	7.430
9	7	21	51.38	2.5918	25	5	52.5	7.603
10	7	24	26.76	2.5875	24	58	11.1	7.775
11	7	27	1.88	2.5831	24	50	19.5	7.945
12	7	29	36.73	2.5785	24	42	17.7	8.115
13	7	32	11.30	2.5738	24	34	5.7	8.283
14	7	34	45.59	2.5691	24	25	43.7	8.449
15	7	37	19.59	2.5642	24	17	11.8	8.614
16	7	39	53.29	2.5592	24	8	30.0	8.778
17	7	42	26.69	2.5542	23	59	38.4	8.942
18	7	44	59.79	2.5491	23	50	37.0	9.103
19	7	47	32.58	2.5438	23	41	26.0	9.262
20	7	50	5.05	2.5385	23	32	5.5	9.420
21	7	52	37.20	2.5332	23	22	35.6	9.577
22	7	55	9.03	2.5277	23	12	56.3	9.732
23	7	57	40.52	2.5221	N.23	3	7.7	9.886

SATURDAY 22.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
0	8	0	11.68	2.5165	N.22	53	10.0	10.038
1	8	2	42.50	2.5108	22	43	3.2	10.188
2	8	5	12.98	2.5051	22	32	47.4	10.337
3	8	7	43.12	2.4994	22	22	22.8	10.483
4	8	10	12.91	2.4936	22	11	49.4	10.629
5	8	12	42.35	2.4877	22	1	7.3	10.773
6	8	15	11.44	2.4818	21	50	16.6	10.916
7	8	17	40.17	2.4758	21	39	17.4	11.056
8	8	20	8.54	2.4699	21	28	9.9	11.194
9	8	22	36.56	2.4639	21	16	54.1	11.332
10	8	25	4.21	2.4578	21	5	30.1	11.467
11	8	27	31.50	2.4517	20	53	58.1	11.600
12	8	29	58.42	2.4456	20	42	18.1	11.732
13	8	32	24.97	2.4395	20	30	30.3	11.862
14	8	34	51.16	2.4335	20	18	34.7	11.990
15	8	37	16.99	2.4274	20	6	31.5	12.117
16	8	39	42.45	2.4212	19	54	20.7	12.242
17	8	42	7.53	2.4149	19	42	2.5	12.363
18	8	44	32.24	2.4088	19	29	37.1	12.483
19	8	46	56.58	2.4027	19	17	4.5	12.603
20	8	49	20.56	2.3966	19	4	24.7	12.722
21	8	51	44.17	2.3904	18	51	37.9	12.837
22	8	54	7.41	2.3842	18	38	44.3	12.950
23	8	56	30.28	2.3781	18	25	43.9	13.062
24	8	58	52.78	2.3720	N.18	12	36.9	13.172

SUNDAY 23.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
	h	m	s	s	°	′	″	″
0	8	58	52.78	2.3720	N.18	12	36.9	13.172
1	9	1	14.92	2.3659	17	59	23.3	13.280
2	9	3	36.69	2.3598	17	46	3.3	13.386
3	9	5	58.10	2.3538	17	32	37.0	13.490
4	9	8	19.15	2.3478	17	19	4.5	13.592
5	9	10	39.84	2.3418	17	5	25.9	13.693
6	9	13	0.17	2.3358	16	51	41.3	13.792
7	9	15	20.14	2.3298	16	37	50.9	13.888
8	9	17	39.75	2.3239	16	23	54.7	13.984
9	9	19	59.01	2.3181	16	9	52.8	14.077
10	9	22	17.92	2.3123	15	55	45.4	14.168
11	9	24	36.49	2.3066	15	41	32.6	14.258
12	9	26	54.71	2.3009	15	27	14.4	14.347
13	9	29	12.59	2.2952	15	12	51.0	14.432
14	9	31	30.13	2.2895	14	58	22.6	14.515
15	9	33	47.33	2.2838	14	43	49.2	14.597
16	9	36	4.19	2.2783	14	29	10.9	14.678
17	9	38	20.73	2.2729	14	14	27.8	14.757
18	9	40	36.94	2.2674	13	59	40.1	14.833
19	9	42	52.82	2.2620	13	44	47.8	14.908
20	9	45	8.38	2.2568	13	29	51.1	14.982
21	9	47	23.63	2.2516	13	14	50.0	15.053
22	9	49	38.57	2.2464	12	59	44.7	15.122
23	9	51	53.19	2.2412	N.12	44	35.3	15.190

MONDAY 24.

Hour.	Right Ascension.			Diff. for 1 m.	Declination.			Diff. for 1 m.
0	9	54	7.51	2.2362	N.12	29	21.9	15.256
1	9	56	21.53	2.2312	12	14	4.6	15.320
2	9	58	35.25	2.2262	11	58	43.5	15.382
3	10	0	48.67	2.2213	11	43	18.7	15.443
4	10	3	1.80	2.2165	11	27	50.3	15.502
5	10	5	14.65	2.2118	11	12	18.4	15.559
6	10	7	27.22	2.2072	10	56	43.2	15.614
7	10	9	39.51	2.2026	10	41	4.7	15.668
8	10	11	51.53	2.1981	10	25	23.0	15.720
9	10	14	3.28	2.1937	10	9	38.3	15.770
10	10	16	14.77	2.1893	9	53	50.6	15.819
11	10	18	26.00	2.1851	9	38	0.0	15.866
12	10	20	36.98	2.1809	9	22	6.7	15.911
13	10	22	47.71	2.1768	9	6	10.7	15.954
14	10	24	58.19	2.1728	8	50	12.2	15.996
15	10	27	8.44	2.1688	8	34	11.2	16.036
16	10	29	18.45	2.1649	8	18	7.9	16.074
17	10	31	28.23	2.1612	8	2	2.3	16.112
18	10	33	37.79	2.1575	7	45	54.5	16.147
19	10	35	47.13	2.1539	7	29	44.7	16.180
20	10	37	56.26	2.1503	7	13	32.9	16.212
21	10	40	5.17	2.1469	6	57	19.3	16.242
22	10	42	13.88	2.1436	6	41	3.9	16.271
23	10	44	22.40	2.1403	6	24	46.8	16.298
24	10	46	30.72	2.1371	N. 6	8	28.2	16.323

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 46 30.72	2.1371	N. 6 8 28.2	16.323
1	10 48 38.85	2.1340	5 52 8.1	16.347
2	10 50 46.80	2.1310	5 35 46.6	16.369
3	10 52 54.57	2.1281	5 19 23.8	16.390
4	10 55 2.17	2.1252	5 2 59.8	16.409
5	10 57 9.60	2.1225	4 46 34.7	16.427
6	10 59 16.87	2.1198	4 30 8.6	16.443
7	11 1 23.98	2.1172	4 13 41.6	16.457
8	11 3 30.94	2.1148	3 57 13.8	16.470
9	11 5 37.76	2.1125	3 40 45.2	16.482
10	11 7 44.44	2.1102	3 24 16.0	16.492
11	11 9 50.98	2.1079	3 7 46.2	16.500
12	11 11 57.38	2.1057	2 51 16.0	16.507
13	11 14 3.66	2.1037	2 34 45.4	16.512
14	11 16 9.83	2.1018	2 18 14.5	16.516
15	11 18 15.88	2.0999	2 1 43.5	16.518
16	11 20 21.82	2.0982	1 45 12.3	16.520
17	11 22 27.66	2.0966	1 28 41.1	16.520
18	11 24 33.41	2.0951	1 12 9.9	16.518
19	11 26 39.07	2.0936	0 55 38.9	16.515
20	11 28 44.64	2.0921	0 39 8.1	16.510
21	11 30 50.12	2.0908	0 22 37.7	16.503
22	11 32 55.53	2.0896	N. 0 6 7.7	16.496
23	11 35 0.87	2.0884	S. 0 10 21.8	16.487

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 37 6.14	2.0874	S. 0 26 50.7	16.477
1	11 39 11.36	2.0865	0 43 19.0	16.465
2	11 41 16.52	2.0856	0 59 46.5	16.451
3	11 43 21.63	2.0848	1 16 13.1	16.436
4	11 45 26.70	2.0842	1 32 38.8	16.420
5	11 47 31.74	2.0837	1 49 3.5	16.403
6	11 49 36.74	2.0831	2 5 27.2	16.385
7	11 51 41.71	2.0827	2 21 49.7	16.364
8	11 53 46.67	2.0825	2 38 10.9	16.342
9	11 55 51.61	2.0823	2 54 30.8	16.319
10	11 57 56.54	2.0821	3 10 49.2	16.295
11	12 0 1.46	2.0820	3 27 6.2	16.270
12	12 2 6.38	2.0821	3 43 21.6	16.243
13	12 4 11.31	2.0822	3 59 35.4	16.215
14	12 6 16.25	2.0824	4 15 47.4	16.184
15	12 8 21.20	2.0827	4 31 57.5	16.153
16	12 10 26.17	2.0831	4 48 5.7	16.121
17	12 12 31.17	2.0836	5 4 12.0	16.088
18	12 14 36.20	2.0842	5 20 16.2	16.053
19	12 16 41.27	2.0848	5 36 18.3	16.016
20	12 18 46.38	2.0855	5 52 18.1	15.977
21	12 20 51.53	2.0863	6 8 15.6	15.938
22	12 22 56.73	2.0872	6 24 10.7	15.898
23	12 25 1.99	2.0882	6 40 3.4	15.857
24	12 27 7.32	2.0893	S. 6 55 53.6	15.814

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 27 7.32	2.0893	S. 6 55 53.6	15.814
1	12 29 12.71	2.0904	7 11 41.1	15.769
2	12 31 18.17	2.0916	7 27 25.9	15.724
3	12 33 23.70	2.0928	7 43 8.0	15.677
4	12 35 29.31	2.0942	7 58 47.2	15.629
5	12 37 35.01	2.0958	8 14 23.5	15.580
6	12 39 40.81	2.0974	8 29 56.8	15.529
7	12 41 46.70	2.0989	8 45 27.0	15.477
8	12 43 52.68	2.1006	9 0 54.1	15.424
9	12 45 58.77	2.1024	9 16 17.9	15.369
10	12 48 4.97	2.1042	9 31 38.4	15.313
11	12 50 11.28	2.1061	9 46 55.5	15.256
12	12 52 17.70	2.1081	10 2 9.1	15.197
13	12 54 24.25	2.1102	10 17 19.1	15.137
14	12 56 30.93	2.1123	10 32 25.6	15.077
15	12 58 37.73	2.1145	10 47 28.4	15.015
16	13 0 44.67	2.1168	11 2 27.4	14.951
17	13 2 51.75	2.1192	11 17 22.5	14.886
18	13 4 58.98	2.1216	11 32 13.7	14.820
19	13 7 6.35	2.1241	11 47 0.9	14.752
20	13 9 13.87	2.1267	12 1 44.0	14.683
21	13 11 21.55	2.1293	12 16 22.9	14.613
22	13 13 29.39	2.1320	12 30 57.6	14.543
23	13 15 37.39	2.1348	S. 12 45 28.0	14.471

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 17 45.56	2.1376	S. 12 59 54.1	14.397
1	13 19 53.90	2.1404	13 14 15.7	14.322
2	13 22 2.41	2.1433	13 28 32.7	14.245
3	13 24 11.10	2.1463	13 42 45.1	14.167
4	13 26 19.97	2.1494	13 56 52.8	14.089
5	13 28 29.03	2.1526	14 10 55.8	14.009
6	13 30 38.28	2.1557	14 24 53.9	13.927
7	13 32 47.72	2.1589	14 38 47.1	13.845
8	13 34 57.35	2.1622	14 52 35.3	13.762
9	13 37 7.18	2.1655	15 6 18.5	13.677
10	13 39 17.21	2.1688	15 19 56.5	13.590
11	13 41 27.44	2.1722	15 33 29.3	13.502
12	13 43 37.88	2.1757	15 46 56.8	13.414
13	13 45 48.53	2.1792	16 0 19.0	13.324
14	13 47 59.39	2.1827	16 13 35.7	13.233
15	13 50 10.46	2.1863	16 26 46.9	13.141
16	13 52 21.75	2.1900	16 39 52.6	13.047
17	13 54 33.26	2.1937	16 52 52.6	12.952
18	13 56 45.00	2.1975	17 5 46.8	12.855
19	13 58 56.96	2.2012	17 18 35.2	12.758
20	14 1 9.14	2.2049	17 31 17.8	12.660
21	14 3 21.55	2.2087	17 43 54.4	12.560
22	14 5 34.19	2.2126	17 56 25.0	12.459
23	14 7 47.06	2.2164	18 8 49.5	12.357
24	14 10 0.16	2.2203	S. 18 21 7.8	12.253

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 10 0.16	2.2203	S. 18 21 7.8	12.253
1	14 12 13.50	2.2243	18 33 19.9	12.149
2	14 14 27.08	2.2283	18 45 25.7	12.043
3	14 16 40.89	2.2322	18 57 25.1	11.936
4	14 18 54.94	2.2362	19 9 18.0	11.827
5	14 21 9.23	2.2402	19 21 4.4	11.718
6	14 23 23.77	2.2443	19 32 44.2	11.607
7	14 25 38.55	2.2483	19 44 17.3	11.496
8	14 27 53.57	2.2523	19 55 43.7	11.383
9	14 30 8.82	2.2563	20 7 3.3	11.269
10	14 32 24.32	2.2604	20 18 16.0	11.154
11	14 34 40.07	2.2645	20 29 21.8	11.038
12	14 36 56.06	2.2686	20 40 20.6	10.921
13	14 39 12.30	2.2727	20 51 12.3	10.802
14	14 41 28.78	2.2767	21 1 56.8	10.682
15	14 43 45.50	2.2807	21 12 34.1	10.561
16	14 46 2.47	2.2848	21 23 4.1	10.439
17	14 48 19.68	2.2888	21 33 26.8	10.317
18	14 50 37.13	2.2928	21 43 42.1	10.193
19	14 52 54.82	2.2969	21 53 49.9	10.067
20	14 55 12.76	2.3010	22 3 50.1	9.940
21	14 57 30.94	2.3050	22 13 42.7	9.812
22	14 59 49.36	2.3089	22 23 27.6	9.684
23	15 2 8.01	2.3128	S. 22 33 4.8	9.555

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 4 26.90	2.3167	S. 22 42 34.2	9.424
1	15 6 46.02	2.3207	22 51 55.7	9.292
2	15 9 5.38	2.3246	23 1 9.3	9.160
3	15 11 24.97	2.3284	23 10 14.9	9.027
4	15 13 44.79	2.3322	23 19 12.5	8.893
5	15 16 4.84	2.3360	23 28 2.0	8.757
6	15 18 25.11	2.3397	23 36 43.3	8.620
7	15 20 45.61	2.3434	23 45 16.4	8.483
8	15 23 6.32	2.3470	23 53 41.3	8.345
9	15 25 27.25	2.3506	24 1 57.8	8.205
10	15 27 48.39	2.3542	24 10 5.9	8.065
11	15 30 9.75	2.3577	24 18 5.6	7.924
12	15 32 31.32	2.3612	24 25 56.8	7.782
13	15 34 53.09	2.3645	24 33 39.5	7.639
14	15 37 15.06	2.3678	24 41 13.5	7.495
15	15 39 37.23	2.3711	24 48 38.9	7.351
16	15 41 59.60	2.3743	24 55 55.6	7.205
17	15 44 22.15	2.3774	25 3 3.5	7.059
18	15 46 44.89	2.3805	25 10 2.7	6.913
19	15 49 7.81	2.3835	25 16 53.1	6.766
20	15 51 30.91	2.3865	25 23 34.6	6.617
21	15 53 54.19	2.3894	25 30 7.1	6.467
22	15 56 17.64	2.3922	25 36 30.7	6.317
23	15 58 41.25	2.3948	25 42 45.2	6.167
24	16 1 5.01	2.3973	S. 25 48 50.7	6.016

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 1 5.01	2.3973	S. 25 48 50.7	6.016
1	16 3 28.93	2.3999	25 54 47.1	5.864
2	16 5 53.00	2.4024	26 0 34.4	5.711
3	16 8 17.22	2.4047	26 6 12.5	5.558
4	16 10 41.57	2.4069	26 11 41.4	5.405
5	16 13 6.05	2.4091	26 17 1.1	5.252
6	16 15 30.66	2.4112	26 22 11.6	5.097
7	16 17 55.40	2.4133	26 27 12.8	4.942
8	16 20 20.26	2.4152	26 32 4.6	4.786
9	16 22 45.23	2.4170	26 36 47.1	4.630
10	16 25 10.30	2.4187	26 41 20.2	4.473
11	16 27 35.47	2.4203	26 45 43.9	4.316
12	16 30 0.73	2.4218	26 49 58.2	4.159
13	16 32 26.08	2.4232	26 54 3.0	4.001
14	16 34 51.51	2.4244	26 57 58.3	3.844
15	16 37 17.01	2.4256	27 1 44.2	3.686
16	16 39 42.58	2.4267	27 5 20.6	3.527
17	16 42 8.21	2.4277	27 8 47.4	3.367
18	16 44 33.90	2.4285	27 12 4.7	3.208
19	16 46 59.63	2.4292	27 15 12.4	3.049
20	16 49 25.40	2.4298	27 18 10.6	2.890
21	16 51 51.21	2.4303	27 20 59.2	2.730
22	16 54 17.04	2.4307	27 23 38.2	2.570
23	16 56 42.89	2.4309	S. 27 26 7.6	2.410

TUESDAY, JANUARY 1, 1878.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 59 8.75	2.4311	S. 27 28 27.4	2.250

PHASES OF THE MOON.

	d	h	m
● New Moon, . .	4	10	3.9
☽ First Quarter, . .	12	9	34.1
○ Full Moon, . . .	19	23	51.5
☾ Last Quarter, . .	26	18	20.1

	d	h
☾ Apogee, ...	11	7.8
☾ Perigee, . . .	23	2.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	95 2 25	2373	96 46 38	2378	98 30 45	2383	100 14 44	2388
	Regulus	W.	58 7 26	2364	59 51 53	2368	61 36 13	2373	63 20 26	2378
	Sun	E.	43 30 58	2727	41 54 54	2734	40 18 59	2741	38 43 14	2750
2	Regulus	W.	71 59 33	2408	73 42 56	2415	75 26 9	2422	77 9 12	2429
	Sun	E.	30 47 36	2803	29 13 12	2817	27 39 6	2832	26 5 20	2849
6	Sun	W.	19 26 40	3221	20 52 24	3218	22 18 12	3218	23 44 0	3220
	Saturn	E.	70 16 52	2752	68 41 21	2764	67 6 6	2777	65 31 8	2789
	α Pegasi	E.	80 14 9	2932	78 42 31	2946	77 11 11	2962	75 40 10	2977
	Mars	E.	84 19 37	2916	82 47 38	2929	81 15 56	2942	79 44 30	2955
7	Sun	W.	30 51 45	3251	32 16 54	3260	33 41 52	3268	35 6 41	3278
	Fomalhaut	E.	48 4 5	3456	46 42 52	3502	45 22 30	3551	44 3 2	3604
	Saturn	E.	57 40 23	2852	56 7 3	2865	54 33 59	2877	53 1 11	2889
	α Pegasi	E.	68 9 58	3057	66 40 56	3074	65 12 15	3092	63 43 56	3110
	Mars	E.	72 11 26	3019	70 41 37	3031	69 12 3	3044	67 42 45	3056
8	Sun	W.	42 7 55	3326	43 31 36	3336	44 55 6	3345	46 18 25	3354
	Fomalhaut	E.	37 41 21	3940	36 28 42	4028	35 17 30	4126	34 7 53	4234
	Saturn	E.	45 21 1	2949	43 49 44	2960	42 18 41	2972	40 47 53	2983
	α Pegasi	E.	56 28 0	3908	55 2 0	3930	53 36 26	3952	52 11 18	3975
	Mars	E.	60 19 59	3116	58 52 9	3128	57 24 33	3138	55 57 10	3149
	α Arietis	E.	97 35 10	2935	96 3 35	2944	94 32 12	2954	93 1 2	2964
9	Sun	W.	53 12 25	3399	54 34 43	3406	55 56 53	3414	57 18 54	3422
	Saturn	E.	33 17 22	3039	31 47 57	3050	30 18 46	3060	28 49 48	3072
	α Pegasi	E.	45 12 45	3408	43 50 37	3439	42 29 5	3473	41 8 11	3509
	Mars	E.	48 43 23	3199	47 17 13	3209	45 51 14	3218	44 25 26	3226
	α Arietis	E.	85 28 9	3009	83 58 7	3018	82 28 16	3025	80 58 34	3033
10	Sun	W.	64 7 2	3459	65 28 20	3457	66 49 32	3461	68 10 40	3465
	α Aquilæ	W.	36 33 46	6040	37 18 34	5839	38 5 33	5649	38 54 34	5483
	Venus	W.	16 58 57	3438	18 20 30	3444	19 41 57	3448	21 3 19	3451
	Mars	E.	37 18 48	3264	35 53 54	3271	34 29 9	3277	33 4 31	3284
	α Arietis	E.	73 32 14	3064	72 3 20	3069	70 34 33	3074	69 5 52	3078
11	Sun	W.	74 55 19	3479	76 16 7	3480	77 36 54	3480	78 57 40	3480
	α Aquilæ	W.	43 25 55	4863	44 24 40	4769	45 24 42	4683	46 25 56	4606
	Venus	W.	27 49 18	3464	29 10 22	3464	30 31 26	3465	31 52 29	3465
	α Arietis	E.	61 43 36	3094	60 15 19	3096	58 47 5	3098	57 18 53	3099
	Aldebaran	E.	93 37 22	3144	92 10 6	3145	90 42 51	3146	89 15 37	3146
12	Sun	W.	85 41 43	3472	87 2 38	3470	88 23 36	3466	89 44 38	3462
	α Aquilæ	W.	51 47 29	4292	52 54 29	4243	54 2 15	4195	55 10 46	4151
	Venus	W.	38 37 58	3456	39 59 11	3454	41 20 27	3449	42 41 48	3445
	α Arietis	E.	49 58 1	3098	48 29 49	3096	47 1 35	3095	45 33 19	3093
	Aldebaran	E.	81 59 22	3142	80 32 3	3140	79 4 42	3137	77 37 17	3134
13	Sun	W.	96 31 11	3433	97 52 50	3426	99 14 37	3418	100 36 33	3410
	α Aquilæ	W.	61 3 14	3963	62 15 30	3931	63 28 18	3901	64 41 37	3872
	Venus	W.	49 30 0	3415	50 52 0	3407	52 14 9	3399	53 36 27	3390
	α Arietis	F.	38 11 17	3079	36 42 42	3076	35 14 3	3073	33 45 20	3070

GREENWICH MEAN TIME.

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	101° 58′ 36″	2394	103° 42′ 20″	2400	105° 25′ 55″	2606	107° 9′ 21″	2412
	Regulus	W.	65 4 32	2384	66 48 30	2389	68 32 20	2396	70 16 1	2402
	Sun	E.	37 7 41	2760	35 32 20	2769	33 57 11	2779	32 22 16	2791
2	Regulus	W.	78 52 5	2437	80 34 47	2444	82 17 19	2452	83 59 40	2461
	Sun	E.	24 31 56	2868	22 58 56	2890	21 26 24	2914	19 54 23	2944
6	Sun	W.	25 9 45	3224	26 35 26	3230	28 1 0	3236	29 26 27	3243
	Saturn	E.	63 56 26	2802	62 22 1	2815	60 47 52	2827	59 13 59	2840
	α Pegasi	E.	74 9 29	2993	72 39 7	3006	71 9 4	3024	69 39 21	3040
	Mars	E.	78 13 21	2968	76 42 28	2981	75 11 51	2994	73 41 31	3006
7	Sun	W.	36 31 18	3288	37 55 44	3297	39 19 59	3307	40 44 2	3316
	Fomalhaut	E.	42 44 32	3660	41 27 2	3721	40 10 37	3787	38 55 21	3860
	Saturn	E.	51 28 38	2901	49 56 21	2913	48 24 19	2926	46 52 33	2937
	α Pegasi	E.	62 15 59	3129	60 48 25	3148	59 21 13	3168	57 54 25	3187
	Mars	E.	66 13 42	3069	64 44 54	3081	63 16 21	3093	61 48 3	3105
8	Sun	W.	47 41 34	3364	49 4 32	3373	50 27 19	3381	51 49 57	3390
	Fomalhaut	E.	32 59 59	4355	31 53 57	4491	30 49 57	4645	29 48 11	4820
	Saturn	E.	39 17 19	2994	37 46 59	3005	36 16 53	3017	34 47 1	3027
	α Pegasi	E.	50 46 37	3299	49 22 24	3324	47 58 40	3351	46 35 27	3378
	Mars	E.	54 30 0	3159	53 3 2	3170	51 36 17	3180	50 9 44	3190
	α Arietis	E.	91 30 4	2973	89 59 18	2983	88 28 44	2992	86 58 21	3001
9	Sun	W.	58 40 46	3428	60 2 31	3435	61 24 8	3441	62 45 38	3446
	Saturn	E.	27 21 4	3083	25 52 34	3096	24 24 19	3108	22 56 19	3122
	α Pegasi	E.	39 47 57	3548	38 28 26	3590	37 9 41	3636	35 51 46	3687
	Mars	E.	42 59 48	3234	41 34 19	3242	40 9 0	3250	38 43 50	3257
	α Arietis	E.	79 29 2	3039	77 59 38	3046	76 30 22	3052	75 1 14	3059
10	Sun	W.	69 31 43	3469	70 52 42	3472	72 13 37	3475	73 34 29	3477
	α Aquilæ	W.	39 45 30	5333	40 38 13	5199	41 32 35	5076	42 28 31	4964
	Venus	W.	22 24 38	3454	23 45 53	3458	25 7 4	3461	26 28 12	3463
	Mars	E.	31 40 1	3289	30 15 37	3296	28 51 21	3302	27 27 12	3307
	α Arietis	E.	67 37 16	3082	66 8 45	3086	64 40 18	3089	63 11 55	3092
11	Sun	W.	80 18 27	3480	81 39 14	3479	83 0 2	3478	84 20 51	3475
	α Aquilæ	W.	47 28 16	4533	48 31 39	4466	49 36 1	4404	50 41 19	4346
	Venus	W.	33 13 32	3464	34 34 36	3463	35 55 41	3462	37 16 48	3459
	α Arietis	E.	55 50 42	3100	54 22 32	3100	52 54 22	3100	51 26 12	3099
	Aldebaran	E.	87 48 23	3146	86 21 9	3146	84 53 55	3144	83 26 39	3143
12	Sun	W.	91 5 45	3457	92 26 57	3452	93 48 15	3446	95 9 40	3440
	α Aquilæ	W.	56 19 59	4109	57 29 52	4069	58 40 24	4032	59 51 32	3998
	Venus	W.	44 3 14	3440	45 24 45	3434	46 46 23	3428	48 8 8	3422
	α Arietis	E.	44 5 1	3091	42 36 40	3088	41 8 16	3085	39 39 48	3082
	Aldebaran	E.	76 9 49	3131	74 42 17	3127	73 14 40	3124	71 46 59	3119
13	Sun	W.	101 58 38	3401	103 20 53	3392	104 43 19	3382	106 5 56	3372
	α Aquilæ	W.	65 55 25	3843	67 9 43	3817	68 24 28	3791	69 39 40	3765
	Venus	W.	54 58 55	3381	56 21 33	3371	57 44 23	3361	59 7 24	3351
	α Arietis	E.	32 16 34	3067	30 47 44	3064	29 18 50	3062	27 49 54	3060

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Aldebaran	E.	70° 19′ 12″	3114	68° 51′ 20″	3110	67° 23′ 22″	3104	65° 55′ 17″	3099
14	Sun	W.	107 28 44	3361	108 51 45	3351	110 14 58	3339	111 38 24	3327
	α Aquilæ	W.	70 55 19	3741	72 11 23	3717	73 27 52	3694	74 44 45	3673
	Venus	W.	60 30 37	3339	61 54 3	3328	63 17 42	3316	64 41 35	3304
	Fomalhaut	W.	44 44 39	3648	46 2 21	3605	47 20 50	3563	48 40 5	3523
	Saturn	W.	26 30 19	3028	27 59 57	3014	29 29 52	3000	31 0 5	2985
	α Pegasi	W.	23 53 48	4476	24 58 1	4309	26 4 52	4151	27 14 5	4000
	Aldebaran	E.	58 33 6	3068	57 4 17	3060	55 35 19	3054	54 6 13	3047
	Pollux	E.	100 49 21	2977	99 18 39	2965	97 47 43	2956	96 16 34	2943
15	Sun	W.	118 39 9	3263	120 4 4	3249	121 29 15	3235	122 54 43	3220
	α Aquilæ	W.	81 14 47	3573	82 33 51	3555	83 53 14	3537	85 12 57	3520
	Venus	W.	71 44 44	3236	73 10 10	3221	74 35 54	3207	76 1 55	3191
	Fomalhaut	W.	55 26 35	3353	56 49 45	3324	58 13 29	3295	59 37 46	3267
	Saturn	W.	38 35 38	2914	40 7 39	2900	41 39 58	2884	43 12 37	2870
	α Pegasi	W.	33 28 5	3563	34 47 20	3498	36 7 46	3438	37 29 19	3385
	Aldebaran	E.	46 38 40	3015	45 8 46	3010	43 38 46	3005	42 8 40	3002
	Pollux	E.	88 37 7	2883	87 4 26	2870	85 31 29	2857	83 58 15	2843
16	Sun	W.	130 6 26	3145	131 33 41	3129	133 1 15	3114	134 29 8	3099
	Venus	W.	83 16 43	3111	84 44 39	3095	86 12 55	3078	87 41 32	3060
	Fomalhaut	W.	66 47 4	3140	68 14 25	3117	69 42 14	3096	71 10 30	3078
	Saturn	W.	51 0 38	2794	52 35 14	2778	54 10 11	2762	55 45 29	2747
	α Pegasi	W.	44 31 15	3165	45 58 6	3129	47 25 41	3094	48 53 58	3061
	Mars	W.	32 4 14	2978	33 34 54	2961	35 5 56	2943	36 37 20	2925
	Aldebaran	E.	34 37 28	3002	33 7 18	3009	31 37 16	3018	30 7 26	3031
	Pollux	E.	76 7 31	2772	74 32 26	2756	72 57 1	2741	71 21 16	2726
17	Venus	W.	95 9 53	2974	96 40 38	2957	98 11 45	2940	99 43 13	2922
	Fomalhaut	W.	78 38 30	2969	80 9 22	2950	81 40 37	2931	83 12 16	2914
	Saturn	W.	63 47 13	2666	65 24 39	2650	67 2 26	2634	68 40 35	2618
	α Pegasi	W.	56 24 56	2917	57 56 53	2891	59 29 23	2866	61 2 25	2842
	Mars	W.	44 19 53	2839	45 53 30	2821	47 27 30	2805	49 1 52	2788
	Pollux	E.	63 17 28	2649	61 39 40	2635	60 1 32	2619	58 23 3	2604
18	Fomalhaut	W.	90 55 58	2833	92 29 43	2818	94 3 47	2805	95 38 9	2792
	Saturn	W.	76 56 44	2539	78 37 3	2525	80 17 42	2510	81 58 42	2494
	α Pegasi	W.	68 55 2	2734	70 30 57	2713	72 7 19	2696	73 44 6	2676
	Mars	W.	56 59 9	2705	58 35 42	2689	60 12 36	2673	61 49 52	2657
	α Arietis	W.	25 28 51	2602	27 7 43	2577	28 47 10	2554	30 27 8	2532
	Pollux	E.	50 5 27	2530	48 24 55	2515	46 44 3	2502	45 2 52	2488
	Regulus	E.	86 55 3	2513	85 14 8	2497	83 32 50	2482	81 51 11	2467
19	Mars	W.	70 1 20	2584	71 40 37	2569	73 20 14	2556	75 0 9	2543
	α Arietis	W.	38 54 4	2439	40 36 43	2423	42 19 45	2408	44 3 9	2392
	Pollux	E.	36 32 21	2427	34 49 25	2416	33 6 13	2406	31 22 47	2396
	Regulus	E.	73 17 52	2397	71 34 13	2384	69 50 15	2371	68 5 58	2358
20	Mars	W.	83 24 5	2484	85 5 41	2473	86 47 32	2463	88 29 37	2454
	α Arietis	W.	52 45 14	2327	54 30 34	2316	56 16 10	2305	58 2 2	2294
	Aldebaran	W.	22 52 16	2793	24 26 53	2720	26 3 6	2659	27 40 41	2606
	Regulus	E.	59 20 12	2301	57 34 14	2291	55 48 2	2281	54 1 35	2272

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L of Diff
13	Aldebaran	E.	64° 27′ 6″	3082	62° 58′ 47″	3067	61° 30′ 21″	3060	60° 1′ 47″	3074
14	Sun	W.	113 2 4	3315	114 25 58	3303	115 50 6	3289	117 14 30	3276
	α Aquilæ	W.	76 2 1	3651	77 19 40	3631	78 37 41	3610	79 56 4	3592
	Venus	W.	66 5 42	3291	67 30 4	3278	68 54 41	3265	70 19 34	3250
	Fomalhaut	W.	50 0 4	3486	51 20 44	3451	52 42 3	3417	54 4 0	3384
	Saturn	W.	32 30 36	2971	34 1 25	2958	35 32 31	2943	37 3 55	2928
	α Pegasi	W.	28 25 25	3906	29 38 39	3804	30 53 37	3715	32 10 8	3635
	Aldebaran	E.	52 36 59	3040	51 7 36	3034	49 38 5	3028	48 8 27	3021
	Pollux	E.	94 45 10	2932	93 13 32	2920	91 41 39	2909	90 9 31	2896
15	Sun	W.	124 20 28	3205	125 46 31	3191	127 12 51	3176	128 39 29	3160
	α Aquilæ	W.	86 32 59	3504	87 53 19	3488	89 13 56	3473	90 34 50	3459
	Venus	W.	77 28 15	3176	78 54 53	3160	80 21 50	3143	81 49 7	3126
	Fomalhaut	W.	61 2 36	3240	62 27 58	3214	63 53 50	3189	65 20 12	3164
	Saturn	W.	44 45 34	2856	46 18 50	2840	47 52 26	2825	49 26 22	2809
	α Pegasi	W.	38 51 53	3334	40 15 25	3287	41 39 52	3244	43 5 9	3203
	Aldebaran	E.	40 38 30	2999	39 8 16	2997	37 37 59	2997	36 7 42	2999
	Pollux	E.	82 24 43	2829	80 50 53	2815	79 16 44	2801	77 42 17	2786
16	Sun	W.	135 57 19	3083	137 25 49	3067	138 54 39	3052	140 23 47	3036
	Venus	W.	89 10 30	3043	90 39 49	3026	92 9 29	3009	93 39 30	2992
	Fomalhaut	W.	72 39 14	3051	74 8 24	3029	75 38 1	3009	77 8 3	2989
	Saturn	W.	57 21 7	2731	58 57 6	2714	60 33 27	2698	62 10 9	2682
	α Pegasi	W.	50 22 55	3030	51 52 31	3000	53 22 44	2971	54 53 33	2944
	Mars	W.	38 9 7	2908	39 41 16	2892	41 13 46	2874	42 46 38	2856
	Aldebaran	E.	28 37 52	3051	27 8 42	3076	25 40 3	3110	24 12 5	3154
	Pollux	E.	69 45 11	2711	68 8 46	2696	66 32 1	2681	64 54 55	2665
17	Venus	W.	101 15 4	2905	102 47 17	2887	104 19 52	2870	105 52 49	2854
	Fomalhaut	W.	84 44 17	2896	86 16 41	2880	87 49 26	2863	89 22 32	2848
	Saturn	W.	70 19 5	2602	71 57 57	2586	73 37 11	2570	75 16 47	2555
	α Pegasi	W.	62 35 58	2819	64 10 1	2797	65 44 33	2775	67 19 34	2754
	Mars	W.	50 36 35	2772	52 11 40	2754	53 47 8	2738	55 22 58	2722
	Pollux	E.	56 44 13	2588	55 5 2	2574	53 25 31	2559	51 45 39	2544
18	Fomalhaut	W.	97 12 47	2780	98 47 41	2769	100 22 50	2758	101 58 13	2749
	Saturn	W.	83 40 3	2480	85 21 45	2465	87 3 47	2451	88 46 9	2437
	α Pegasi	W.	75 21 18	2658	76 58 54	2640	78 36 54	2624	80 15 16	2608
	Mars	W.	63 27 29	2643	65 5 26	2627	66 43 44	2612	68 22 22	2596
	α Arietis	W.	32 7 37	2512	33 48 34	2492	35 29 58	2473	37 11 49	2456
	Pollux	E.	43 21 22	2475	41 39 33	2462	39 57 26	2450	38 15 2	2438
	Regulus	E.	80 9 12	2453	78 26 52	2436	76 44 12	2424	75 1 12	2410
19	Mars	W.	76 40 22	2531	78 20 52	2519	80 1 39	2506	81 42 44	2494
	α Arietis	W.	45 46 55	2378	47 31 1	2364	49 15 27	2351	51 0 12	2339
	Pollux	E.	29 39 9	2390	27 55 20	2384	26 11 22	2379	24 27 17	2376
	Regulus	E.	66 21 23	2346	64 36 31	2334	62 51 21	2323	61 5 55	2311
20	Mars	W.	90 11 55	2446	91 54 26	2436	93 37 10	2428	95 20 5	2420
	α Arietis	W.	59 48 10	2285	61 34 32	2276	63 21 7	2267	65 7 55	2260
	Aldebaran	W.	29 19 25	2564	30 59 10	2526	32 39 48	2492	34 21 12	2463
	Regulus	E.	52 14 54	2265	50 28 0	2256	48 40 54	2247	46 53 36	2239

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	α Arietis	W.	66 54 54	2251	68 42 5	2245	70 29 26	2238	72 16 57	2233
	Aldebaran	W.	36 3 17	2438	37 45 58	2416	39 29 10	2396	41 12 51	2378
	Regulus	E.	45 6 7	2233	43 18 28	2226	41 30 39	2220	39 42 42	2214
	Spica	E.	99 8 28	2235	97 20 53	2229	95 33 8	2223	93 45 14	2217
22	α Arietis	W.	81 16 25	2211	83 4 36	2208	84 52 52	2206	86 41 11	2204
	Aldebaran	W.	49 56 47	2315	51 42 24	2307	53 28 14	2300	55 14 14	2293
	Regulus	E.	30 41 9	2196	28 52 35	2193	27 3 57	2191	25 15 16	2190
	Spica	E.	84 43 57	2197	82 55 25	2194	81 6 49	2192	79 18 10	2191
23	Aldebaran	W.	64 6 9	2274	65 52 46	2273	67 39 25	2272	69 26 5	2272
	Pollux	W.	21 7 31	2260	22 54 29	2251	24 41 40	2244	26 29 2	2239
	Spica	E.	70 14 35	2190	68 25 53	2191	66 37 12	2192	64 48 33	2195
24	Aldebaran	W.	78 19 11	2281	80 5 39	2283	81 52 3	2287	83 38 22	2291
	Pollux	W.	35 26 57	2235	37 14 33	2236	39 2 7	2239	40 49 37	2241
	Spica	E.	55 46 17	2210	53 58 5	2215	52 10 0	2220	50 22 2	2224
	Antares	E.	101 36 57	2205	99 48 37	2209	98 0 23	2214	96 12 16	2218
	Sun	E.	126 28 5	2540	124 47 47	2543	123 7 34	2548	121 27 27	2551
25	Aldebaran	W.	92 28 12	2317	94 13 46	2324	95 59 11	2331	97 44 26	2337
	Pollux	W.	49 45 53	2262	51 32 49	2267	53 19 37	2272	55 6 17	2278
	Spica	E.	41 24 6	2253	39 36 58	2260	37 49 59	2267	36 3 11	2274
	Antares	E.	87 13 28	2245	85 26 7	2251	83 38 55	2257	81 51 52	2263
	Sun	E.	113 8 27	2578	111 29 2	2584	109 49 45	2590	108 10 36	2597
26	Pollux	W.	63 57 26	2310	65 43 11	2317	67 28 46	2324	69 14 11	2331
	Regulus	W.	26 57 35	2300	28 43 35	2307	30 29 25	2314	32 15 4	2321
	Spica	E.	27 12 1	2317	25 26 26	2326	23 41 4	2336	21 55 57	2348
	Antares	E.	72 59 3	2298	71 13 0	2305	69 27 8	2312	67 41 26	2320
	Sun	E.	99 57 16	2633	98 19 6	2640	96 41 6	2648	95 3 16	2656
27	Pollux	W.	77 58 36	2368	79 42 57	2375	81 27 7	2383	83 11 6	2391
	Regulus	W.	41 0 41	2358	42 45 16	2366	44 29 39	2374	46 13 51	2382
	Antares	E.	58 55 40	2357	57 11 4	2365	55 26 39	2373	53 42 26	2381
	Sun	E.	86 56 49	2697	85 20 5	2704	83 43 31	2713	82 7 8	2722
28	Pollux	W.	91 48 12	2430	93 31 4	2438	95 13 44	2446	96 56 13	2454
	Regulus	W.	54 52 4	2421	56 35 9	2429	58 18 3	2436	60 0 46	2444
	Antares	E.	45 4 8	2420	43 21 2	2429	41 38 8	2436	39 55 24	2444
	Sun	E.	74 8 6	2764	72 32 51	2773	70 57 48	2782	69 22 56	2790
29	Regulus	W.	68 31 33	2484	70 13 9	2492	71 54 34	2499	73 35 48	2507
	Spica	W.	14 39 20	2535	16 19 44	2533	18 0 11	2534	19 40 37	2537
	Antares	E.	31 24 35	2483	29 42 58	2492	28 1 33	2499	26 20 19	2507
	Sun	E.	61 31 25	2834	59 57 41	2842	58 24 8	2851	56 50 47	2860
30	Regulus	W.	81 59 15	2546	83 39 24	2555	85 19 21	2563	86 59 7	2570
	Spica	W.	28 1 26	2562	29 41 13	2568	31 20 52	2575	33 0 21	2582
	Sun	E.	49 6 51	2905	47 34 39	2914	46 2 38	2924	44 30 49	2933
31	Spica	W.	41 15 22	2618	42 53 52	2626	44 32 12	2634	46 10 21	2641
	Sun	E.	36 54 45	2982	35 24 10	2993	33 53 48	3003	32 23 39	3014

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Day of the Month.	Star's Name and Position.		Midnight.	P.L. of Diff.	XVh.	P.L of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
21	α Arietis	W.	74° 4′ 36″	2227	75° 52′ 23″	2222	77° 40′ 18″	2218	79° 28′ 19″	2214
	Aldebaran	W.	42 56 58	2360	44 41 27	2348	46 26 16	2336	48 11 23	2324
	Regulus	E.	37 54 36	2210	36 6 23	2206	34 18 4	2202	32 29 39	2198
	Spica	E.	91 57 12	2212	90 9 2	2208	88 20 46	2204	86 32 24	2200
22	α Arietis	W.	88 29 32	2203	90 17 55	2202	92 6 19	2202	93 54 44	2202
	Aldebaran	W.	57 0 24	2287	58 46 42	2283	60 33 6	2280	62 19 35	2277
	Regulus	E.	23 26 34	2190	21 37 51	2189	19 49 7	2190	18 0 24	2192
	Spica	E.	77 29 29	2190	75 40 46	2189	73 52 2	2189	72 3 18	2190
23	Aldebaran	W.	71 12 46	2273	72 59 25	2274	74 46 3	2275	76 32 39	2278
	Pollux	W.	28 16 31	2236	30 4 5	2234	31 51 42	2233	33 39 20	2234
	Spica	E.	62 59 58	2197	61 11 26	2200	59 22 58	2203	57 34 35	2206
24	Aldebaran	W.	85 24 34	2296	87 10 40	2301	88 56 38	2306	90 42 29	2311
	Pollux	W.	42 37 3	2245	44 24 24	2248	46 11 40	2252	47 58 50	2257
	Spica	E.	48 34 10	2229	46 46 26	2235	44 58 51	2241	43 11 24	2247
	Antares	E.	94 24 15	2220	92 36 22	2226	90 48 36	2233	89 0 58	2239
	Sun	E.	119 47 25	2556	118 7 30	2561	116 27 41	2566	114 48 0	2572
25	Aldebaran	W.	99 29 31	2345	101 14 25	2353	102 59 8	2361	104 43 39	2368
	Pollux	W.	56 52 49	2284	58 39 12	2290	60 25 26	2296	62 11 31	2303
	Spica	E.	34 16 33	2282	32 30 7	2289	30 43 52	2298	28 57 50	2307
	Antares	E.	80 4 58	2270	78 18 14	2277	76 31 40	2283	74 45 16	2291
	Sun	E.	106 31 37	2604	104 52 47	2611	103 14 7	2618	101 35 36	2626
26	Pollux	W.	70 59 25	2338	72 44 29	2346	74 29 22	2353	76 14 4	2360
	Regulus	W.	34 0 33	2328	35 45 51	2335	37 30 59	2343	39 15 56	2351
	Spica	E.	20 11 7	2360	18 26 35	2375	16 42 24	2392	14 58 38	2412
	Antares	E.	65 55 55	2327	64 10 35	2334	62 25 25	2342	60 40 27	2350
	Sun	E.	93 25 37	2664	91 48 9	2672	90 10 51	2680	88 33 44	2689
27	Pollux	W.	84 54 53	2398	86 38 30	2407	88 21 55	2415	90 5 9	2422
	Regulus	W.	47 57 52	2390	49 41 41	2397	51 25 20	2405	53 8 48	2413
	Antares	E.	51 58 24	2389	50 14 33	2396	48 30 53	2405	46 47 25	2412
	Sun	E.	80 30 57	2730	78 54 57	2739	77 19 9	2747	75 43 32	2756
28	Pollux	W.	98 38 31	2462	100 20 38	2470	102 2 33	2478	103 44 17	2487
	Regulus	W.	61 43 18	2452	63 25 39	2460	65 7 48	2468	66 49 46	2476
	Antares	E.	38 12 52	2453	36 30 31	2460	34 48 21	2467	33 6 22	2476
	Sun	E.	67 48 15	2798	66 13 45	2808	64 39 27	2816	63 5 20	2825
29	Regulus	W.	75 16 52	2515	76 57 44	2523	78 38 25	2531	80 18 55	2538
	Spica	W.	21 20 59	2540	23 1 16	2545	24 41 27	2551	26 21 30	2556
	Antares	E.	24 39 16	2515	22 58 24	2523	21 17 43	2531	19 37 13	2540
	Sun	E.	55 17 37	2869	53 44 38	2878	52 11 51	2887	50 39 15	2896
30	Regulus	W.	88 38 43	2578	90 18 8	2587	91 57 21	2595	93 36 23	2602
	Spica	W.	34 39 41	2589	36 18 51	2596	37 57 51	2603	39 36 42	2611
	Sun	E.	42 59 12	2942	41 27 47	2952	39 56 34	2962	38 25 33	2972
31	Spica	W.	47 48 20	2649	49 26 8	2657	51 3 46	2665	52 41 13	2674
	Sun	E.	30 53 43	3025	29 24 1	3037	27 54 34	3049	26 25 22	3062

GREENWICH MEAN TIME.

	JANUARY.						FEBRUARY.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	16 37 24.29	+13.051	−20 44 31.2	−31.74	21 53.6	1	19 23 25.85	+13.369	−22 5 49.6	+19.77	22 37.6
2	16 42 38.00	13.092	20 56 55.3	30.27	21 54.9	2	19 28 46.41	13.343	21 57 35.0	21.43	22 39.0
3	16 47 52.65	13.132	21 8 43.9	28.78	21 56.2	3	19 34 6.35	13.317	21 48 40.7	23.06	22 40.4
4	16 53 8.24	13.170	21 19 56.6	27.27	21 57.5	4	19 39 25.61	13.287	21 39 6.9	24.72	22 41.8
5	16 58 24.74	13.206	21 30 32.7	25.74	21 58.8	5	19 44 44.15	13.257	21 28 54.0	26.34	22 43.1
6	17 3 42.10	13.242	21 40 31.8	24.19	22 0.2	6	19 50 1.93	13.224	21 18 2.4	27.95	22 44.4
7	17 9 0.27	13.274	21 49 53.3	22.61	22 1.6	7	19 55 18.91	13.189	21 6 32.5	29.53	22 45.7
8	17 14 19.21	13.305	21 58 36.8	21.02	22 3.0	8	20 0 35.03	13.154	20 54 24.9	31.11	22 47.0
9	17 19 38.89	13.335	22 6 41.8	19.40	22 4.4	9	20 5 50.28	13.116	20 41 39.9	32.66	22 48.3
10	17 24 59.24	13.362	22 14 8.0	17.77	22 5.8	10	20 11 4.60	13.078	20 28 17.9	34.18	22 49.6
11	17 30 20.22	13.387	22 20 54.8	16.13	22 7.2	11	20 16 17.98	13.037	20 14 19.6	35.68	22 50.9
12	17 35 41.77	13.410	22 27 1.9	14.47	22 8.7	12	20 21 30.37	12.995	19 59 45.6	37.16	22 52.1
13	17 41 3.84	13.430	22 32 29.0	12.79	22 10.1	13	20 26 41.75	12.952	19 44 36.4	38.62	22 53.3
14	17 46 26.37	13.449	22 37 15.8	11.10	22 11.6	14	20 31 52.08	12.909	19 28 52.4	40.05	22 54.5
15	17 51 49.31	13.464	22 41 22.0	9.41	22 13.0	15	20 37 1.36	12.864	19 12 34.3	41.45	22 55.7
16	17 57 12.61	13.478	22 44 47.4	7.70	22 14.5	16	20 42 9.56	12.819	18 55 42.9	42.83	22 56.9
17	18 2 36.20	13.488	22 47 31.6	5.99	22 15.9	17	20 47 16.66	12.773	18 38 18.7	44.19	22 58.1
18	16 8 0.02	13.497	22 49 34.7	4.27	22 17.4	18	20 52 22.65	12.726	18 20 22.3	45.51	22 59.3
19	18 13 24.01	13.502	22 50 56.5	2.54	22 18.8	19	20 57 27.51	12.679	18 1 54.4	46.81	23 0.5
20	18 18 48.11	13.506	22 51 36.8	− 0.81	22 20.3	20	21 2 31.24	12.632	17 42 55.7	48.08	23 1.6
21	18 24 12.27	13.507	22 51 35.5	+ 0.92	22 21.7	21	21 7 33.82	12.584	17 23 26.8	49.33	23 2.6
22	18 29 36.44	13.506	22 50 52.7	2.66	22 23.2	22	21 12 35.26	12.537	17 3 28.3	50.55	23 3.7
23	18 35 0.54	13.502	22 49 28.2	4.38	22 24.6	23	21 17 35.56	12.489	16 43 1.0	51.73	23 4.7
24	18 40 24.53	13.497	22 47 22.1	6.11	22 26.1	24	21 22 34.72	12.441	16 22 5.4	52.89	23 5.7
25	18 45 48.35	13.488	22 44 34.6	7.84	22 27.5	25	21 27 32.73	12.394	16 0 42.4	54.02	23 6.7
26	18 51 11.95	13.478	22 41 5.7	9.57	22 29.0	26	21 32 29.63	12.347	15 38 52.6	55.12	23 7.7
27	18 56 35.26	13.465	22 36 55.4	11.29	22 30.4	27	21 37 25.40	12.300	15 16 36.7	56.19	23 8.6
28	19 1 58.25	13.450	22 32 3.9	13.00	22 31.9	28	21 42 20.04	12.254	14 53 55.5	57.23	23 9.6
29	19 7 20.85	13.433	22 26 31.4	14.70	22 33.3	29	21 47 13.58	12.208	14 30 49.6	58.25	23 10.5
30	19 12 43.02	13.413	22 20 18.0	16.40	22 34.8	30	21 52 6.06	12.163	14 7 19.6	59.24	23 11.4
31	19 18 4.70	13.392	22 13 24.0	18.09	22 36.2	31	21 56 57.47	12.119	13 43 26.4	60.19	23 12.3
32	19 23 25.85	+13.369	−22 5 49.6	+19.77	22 37.6	32	22 1 47.82	+12.076	−13 19 10.7	+61.12	23 13.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	6″.2	6″.1	6″.0	5″.9	5″.8	5″.7	5″.7
Hor. Parallax	6.5	6.3	6.2	6.1	6.0	5.9	5.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	5″.6	5″.5	5″.4	5″.4	5″.3
Hor. Parallax	5.8	5.7	5.6	5.6	5.5

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 47 13.58	+12.208	−14 30 49.6	+58.25	23 10.5	1	0 11 56.29	+11.347	− 0 17 12.1	+74.55	23 32.8
2	21 52 6.06	12.163	14 7 19.6	59.24	23 11.4	2	0 16 28.59	11.344	+ 0 12 37.8	74.60	23 33.3
3	21 56 37.47	12.119	13 43 26.4	60.19	23 12.3	3	0 21 0.84	11.343	0 42 28.4	74.61	23 33.9
4	22 1 47.82	12.076	13 19 10.7	61.12	23 13.2	4	0 25 33.08	11.344	1 12 19.0	74.60	23 34.5
5	22 6 37.15	12.033	12 54 33.2	62.02	23 14.1	5	0 30 5.34	11.346	1 42 9.0	74.56	23 35.1
6	22 11 25.46	11.991	12 29 34.5	62.87	23 15.0	6	0 34 37.67	11.350	2 11 57.7	74.49	23 35.7
7	22 16 12.78	11.950	12 4 15.5	63.71	23 15.8	7	0 39 10.12	11.355	2 41 44.3	74.39	23 36.3
8	22 20 59.13	11.910	11 38 36.8	64.51	23 16.6	8	0 43 42.72	11.362	3 11 28.1	74.26	23 36.9
9	22 25 44.53	11.872	11 12 39.2	65.28	23 17.4	9	0 48 15.52	11.371	3 41 8.5	74.09	23 37.5
10	22 30 29.00	11.833	10 46 23.6	66.03	23 18.2	10	0 52 48.55	11.382	4 10 44.6	73.91	23 38.2
11	22 35 12.58	11.797	10 19 50.5	66.73	23 18.9	11	0 57 21.85	11.394	4 40 15.7	73.68	23 38.8
12	22 39 55.29	11.761	9 53 0.8	67.41	23 19.7	12	1 1 55.46	11.408	5 9 41.0	73.43	23 39.4
13	22 44 37.16	11.727	9 25 55.1	68.06	23 20.5	13	1 6 29.43	11.424	5 38 59.9	73.15	23 40.0
14	22 49 18.21	11.693	8 58 34.4	68.66	23 21.2	14	1 11 3.78	11.440	6 8 11.6	72.84	23 40.7
15	22 53 58.47	11.661	8 30 59.4	69.25	23 21.9	15	1 15 38.56	11.458	6 37 15.4	72.48	23 41.3
16	22 58 37.98	11.630	8 3 10.6	69.80	23 22.6	16	1 20 13.80	11.478	7 6 10.4	72.11	23 42.0
17	23 3 16.77	11.600	7 35 9.0	70.33	23 23.3	17	1 24 49.53	11.500	7 34 56.2	71.71	23 42.6
18	23 7 54.86	11.572	7 6 56.2	70.81	23 24.0	18	1 29 25.79	11.523	8 3 31.9	71.27	23 43.3
19	23 12 32.30	11.546	6 38 30.0	71.26	23 24.7	19	1 34 2.62	11.548	8 31 56.7	70.81	23 40.0
20	23 17 9.11	11.521	6 9 54.2	71.71	23 25.4	20	1 38 40.06	11.574	9 0 10.0	70.30	23 44.7
21	23 21 45.33	11.497	5 41 8.4	72.10	23 26.0	21	1 43 18.15	11.601	9 28 11.1	69.78	23 45.4
22	23 26 21.01	11.475	5 12 13.4	72.47	23 26.7	22	1 47 56.91	11.630	9 55 59.2	69.23	23 46.1
23	23 30 56.17	11.455	4 43 9.9	72.81	23 27.3	23	1 52 36.39	11.661	10 23 33.5	68.63	23 46.8
24	23 35 30.86	11.436	4 13 58.6	73.12	23 27.9	24	1 57 16.61	11.692	10 50 53.3	68.02	23 47.5
25	23 40 5.11	11.419	3 44 40.2	73.41	23 28.5	25	2 1 57.61	11.726	11 17 57.9	67.37	23 48.2
26	23 44 38.98	11.404	3 15 15.5	73.65	23 29.2	26	2 6 39.42	11.761	11 44 46.6	66.69	23 49.0
27	23 49 12.50	11.389	2 45 45.0	73.88	23 29.8	27	2 11 22.08	11.797	12 11 18.6	65.98	23 49.8
28	23 53 45.70	11.378	2 16 9.6	74.07	23 30.4	28	2 16 5.62	11.833	12 37 33.3	65.26	23 50.6
29	23 58 18.64	11.368	1 46 29.9	74.23	23 31.0	29	2 20 50.05	11.872	13 3 30.0	64.47	23 51.4
30	0 2 51.35	11.360	1 16 46.7	74.37	23 31.6	30	2 25 35.42	11.910	13 29 7.9	63.68	23 52.3
31	0 7 23.89	11.353	0 47 0.5	74.47	23 32.2	31	2 30 21.75	11.951	13 54 26.2	62.84	23 53.1
32	0 11 56.29	+11.347	− 0 17 12.1	+74.55	23 32.8	32	2 35 9.07	+11.993	+14 19 24.2	+61.99	23 54.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter	5.″3	5.″2	5.″2	5.″1	5.″1	5.″1	Semidiameter	5.″0	5.″0	5.″0	5.″0	5.″0	4.″9
Hor. Parallax	5.5	5.4	5.4	5.3	5.3	5.3	Hor. Parallax	5.2	5.2	5.2	5.2	5.1	5.1

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 30 21.75	+11.951	+13 54 26.2	+62.84	23 53.1	1	5 7 6.95	+13.269	+23 11 46.5	+22.68	0 26.8
2	2 35 9.07	11.993	14 19 24.2	61.99	23 54.0	2	5 12 25.73	13.297	23 20 30.6	20.99	0 28.2
3	2 40 57.41	12.036	14 44 1.2	61.10	23 54.9	3	5 17 45.17	13.323	23 28 34.1	19.30	0 29.6
4	2 44 46.78	12.079	15 8 16.4	60.17	23 55.8	4	5 23 5.21	13.348	23 35 56.6	17.58	0 31.0
5	2 49 37.20	12.123	15 32 9.1	59.22	23 56.7	5	5 28 25.81	13.369	23 42 37.8	15.85	0 32.4
6	2 54 28.69	12.168	15 55 38.6	58.24	23 57.7	6	5 33 46.89	13.389	23 48 37.5	14.11	0 33.8
7	2 59 21.27	12.214	16 18 44.2	57.23	23 58.6	7	5 39 8.42	13.406	23 53 55.3	12.37	0 35.2
8	3 4 14.95	12.260	16 41 25.1	56.18	23 59.6	8	5 44 30.35	13.421	23 58 30.9	10.60	0 36.6
9	3 9 9.73	12.306	17 3 40.5	55.10		9	5 49 52.60	13.433	24 2 24.1	8.83	0 38.0
10	3 14 5.64	12.353	17 25 29.6	54.00	0 0.6	10	5 55 15.11	13.444	24 5 34.7	7.05	0 39.5
11	3 19 2.67	12.400	17 46 51.8	52.85	0 1.6	11	6 0 37.83	13.451	24 8 2.7	5.27	0 40.9
12	3 24 0.83	12.447	18 7 46.3	51.68	0 2.6	12	6 6 0.70	13.456	24 9 47.7	3.48	0 42.4
13	3 29 0.12	12.494	18 28 12.3	50.48	0 3.7	13	6 11 23.65	13.458	24 10 49.8	+ 1.69	0 43.8
14	3 34 0.54	12.541	18 48 9.2	49.25	0 4.7	14	6 16 46.63	13.458	24 11 8.9	− 0.11	0 45.3
15	3 39 2.08	12.588	19 7 36.3	47.99	0 5.8	15	6 22 9.56	13.454	24 10 45.0	1.90	0 46.7
16	3 44 4.74	12.634	19 26 32.9	46.70	0 6.9	16	6 27 32.38	13.448	24 9 38.0	3.69	0 48.2
17	3 49 8.51	12.680	19 44 58.2	45.40	0 8.0	17	6 32 55.03	13.439	24 7 48.0	5.48	0 49.6
18	3 54 13.38	12.727	20 2 51.6	44.06	0 9.1	18	6 38 17.44	13.429	24 5 15.0	7.27	0 51.0
19	3 59 19.36	12.772	20 20 12.5	42.69	0 10.2	19	6 43 39.57	13.415	24 1 59.2	9.05	0 52.4
20	4 4 26.41	12.817	20 37 0.3	41.29	0 11.4	20	6 49 1.35	13.400	23 58 0.7	10.82	0 53.9
21	4 9 34.52	12.861	20 53 14.2	39.87	0 12.6	21	6 54 22.72	13.381	23 53 19.6	12.59	0 55.3
22	4 14 43.66	12.904	21 8 53.7	38.43	0 13.8	22	6 59 43.62	13.361	23 47 56.1	14.36	0 56.7
23	4 19 53.83	12.945	21 23 58.1	36.95	0 15.1	23	7 5 4.00	13.337	23 41 50.5	16.11	0 58.1
24	4 25 4.99	12.986	21 38 26.8	35.45	0 16.3	24	7 10 23.80	13.312	23 35 3.1	17.85	0 59.5
25	4 30 17.13	13.026	21 52 19.2	33.92	0 17.6	25	7 15 42.98	13.285	23 27 34.1	19.57	1 0.9
26	4 35 30.23	13.065	22 5 34.7	32.38	0 18.9	26	7 21 1.47	13.256	23 19 23.6	21.29	1 2.2
27	4 40 44.25	13.104	22 18 12.8	30.81	0 20.2	27	7 26 19.24	13.225	23 10 32.1	22.99	1 3.6
28	4 45 59.16	13.140	22 30 13.1	29.22	0 21.5	28	7 31 36.23	13.191	23 1 0.1	24.67	1 4.9
29	4 51 14.92	13.174	22 41 35.0	27.62	0 22.8	29	7 36 52.40	13.155	22 50 47.7	26.35	1 6.2
30	4 56 31.49	13.208	22 52 18.2	25.99	0 24.1	30	7 42 7.72	13.119	22 39 55.5	28.00	1 7.5
31	5 1 48.85	13.239	23 2 22.2	24.35	0 25.5	31	7 47 22.14	13.081	22 28 23.9	29.63	1 8.8
32	5 7 6.95	+13.269	+23 11 46.5	+22.68	0 26.8	32	7 52 35.62	+13.041	+22 16 13.2	−31.25	1 10.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	4.9″	4.9″	4.9″	4.9″	5.0″	5.0″	5.0″
Hor. Parallax	5.1	5.1	5.1	5.1	5.1	5.1	0.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter	5.0″	5.0″	5.0″	5.1″	5.1″	5.2″
Hor. Parallax	5.2	5.2	5.2	5.3	5.3	5.4

NOTE.—North declinations are marked +, south declinations —.

VENUS, 1877.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 47 22.14	+13.081	+22 28 23.9	−29.63	1 8.8
2	7 52 35.62	13.041	22 16 13.2	31.25	1 10.1
3	7 57 48.13	13.000	22 3 24.0	32.85	1 11.4
4	8 2 59.63	12.958	21 49 56.7	34.43	1 12.6
5	8 8 10.10	12.913	21 35 51.9	35.97	1 13.8
6	8 13 19.49	12.868	21 21 10.1	37.51	1 15.0
7	8 18 27.78	12.822	21 5 51.9	39.01	1 16.2
8	8 23 34.94	12.774	20 49 57.8	40.50	1 17.4
9	8 28 40.95	12.725	20 33 28.3	41.97	1 18.6
10	8 33 45.78	12.676	20 16 24.0	43.39	1 19.8
11	8 38 49.40	12.626	19 58 45.8	44.79	1 20.9
12	8 43 51.82	12.575	19 40 34.2	46.17	1 22.0
13	8 48 53.02	12.524	19 21 49.9	47.52	1 23.1
14	8 53 52.98	12.472	19 2 33.5	48.85	1 24.1
15	8 58 51.68	12.420	18 42 45.7	50.14	1 25.2
16	9 3 49.14	12.368	18 22 27.3	51.40	1 26.2
17	9 8 45.33	12.315	18 1 38.8	52.64	1 27.2
18	9 13 40.25	12.262	17 40 21.0	53.85	1 28.2
19	9 18 33.91	12.209	17 18 34.6	55.02	1 29.1
20	9 23 26.31	12.157	16 56 20.4	56.17	1 30.0
21	9 28 17.46	12.105	16 33 38.9	57.29	1 30.9
22	9 33 7.36	12.054	16 10 31.0	58.37	1 31.8
23	9 37 56.03	12.003	15 46 57.2	59.43	1 32.7
24	9 42 43.48	11.952	15 22 58.5	60.46	1 33.5
25	9 47 29.72	11.902	14 58 35.4	61.46	1 34.3
26	9 52 14.78	11.853	14 33 48.7	62.43	1 35.1
27	9 56 58.67	11.804	14 8 39.1	63.37	1 35.9
28	10 1 41.41	11.757	13 43 7.3	64.27	1 36.7
29	10 6 23.03	11.710	13 17 14.1	65.16	1 37.5
30	10 11 3.55	11.665	12 51 0.1	66.00	1 38.3
31	10 15 43.00	11.620	12 24 26.0	66.83	1 39.0
32	10 20 21.40	+11.577	+11 57 32.7	−67.62	1 39.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter	5″.2	5″.3	5″.3	5″.4	5″.5	5″.6
Hor. Parallax	5.4	5.5	5.5	5.6	5.7	5.7

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 20 21.40	+11.577	+11 57 32.7	−67.62	1 39.7
2	10 24 58.79	11.536	11 30 20.7	68.39	1 40.4
3	10 29 35.19	11.496	11 2 50.8	69.11	1 41.0
4	10 34 10.63	11.457	10 35 3.7	69.82	1 41.6
5	10 38 45.14	11.418	10 7 0.1	70.48	1 42.2
6	10 43 18.75	11.381	9 38 40.8	71.12	1 42.8
7	10 47 51.49	11.345	9 10 6.5	71.73	1 43.4
8	10 52 23.39	11.311	8 41 17.9	72.31	1 44.0
9	10 56 54.49	11.279	8 12 15.8	72.86	1 44.6
10	11 1 24.81	11.248	7 43 0.9	73.38	1 45.2
11	11 5 54.40	11.218	7 13 33.9	73.86	1 45.7
12	11 10 23.29	11.189	6 43 55.6	74.32	1 46.3
13	11 14 51.51	11.162	6 14 6.7	74.76	1 46.8
14	11 19 19.10	11.137	5 44 7.8	75.15	1 47.3
15	11 23 46.09	11.112	5 13 59.8	75.52	1 47.8
16	11 28 12.52	11.090	4 43 43.3	75.85	1 48.3
17	11 32 38.43	11.069	4 13 19.2	76.16	1 48.8
18	11 37 3.86	11.050	3 42 48.0	76.44	1 49.3
19	11 41 28.84	11.032	3 12 10.5	76.68	1 49.8
20	11 45 53.42	11.016	2 41 27.4	76.91	1 50.3
21	11 50 17.63	11.001	2 10 39.4	77.10	1 50.7
22	11 54 41.52	10.989	1 39 47.1	77.26	1 51.2
23	11 59 5.14	10.979	1 8 51.3	77.40	1 51.6
24	12 3 28.52	10.970	0 37 52.6	77.50	1 52.1
25	12 7 51.70	10.962	+ 0 6 51.7	77.58	1 52.5
26	12 12 14.72	10.957	− 0 24 10.7	77.63	1 53.0
27	12 16 37.65	10.953	0 55 13.8	77.64	1 53.4
28	12 21 0.51	10.952	1 26 17.1	77.64	1 53.8
29	12 35 23.36	10.953	1 57 19.9	77.61	1 54.2
30	12 29 46.23	10.954	2 28 21.7	77.54	1 54.6
31	12 34 9.17	10.958	2 59 21.5	77.44	1 55.1
32	12 38 32.22	+10.963	− 3 30 18.8	−77.32	1 55.5

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter	5″.6	5″.7	5″.8	5″.9	6″.1	6″.2
Hor. Parallax	5.8	5.9	6.0	6.1	6.3	6.4

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	12 38 32.22	+10.963	− 3 30 18.8	−77.32	1 55.5
2	12 42 55.43	10.970	4 1 12.8	77.17	1 56.0
3	12 47 18.83	10.980	4 32 2.8	77.00	1 56.4
4	12 51 42.47	10.991	5 2 48.2	76.78	1 56.9
5	12 56 6.37	11.003	5 33 28.2	76.55	1 57.3
6	13 0 30.60	11.017	6 4 2.2	76.28	1 57.8
7	13 4 55.18	11.032	6 34 29.4	75.98	1 58.3
8	13 9 20.16	11.049	7 4 49.1	75.65	1 58.8
9	13 13 45.56	11.068	7 35 0.5	75.29	1 59.3
10	13 18 11.43	11.088	8 5 2.9	74.90	1 50.8
11	13 22 37.80	11.109	8 34 55.7	74.49	2 0.3
12	13 27 4.70	11.132	9 4 38.0	74.03	2 0.8
13	13 31 32.17	11.157	9 34 9.2	73.56	2 1.3
14	13 36 0.24	11.183	10 3 28.4	73.05	2 1.9
15	13 40 28.93	11.210	10 32 35.0	72.50	2 2.4
16	13 44 58.30	11.238	11 1 28.2	71.93	2 3.0
17	13 49 28.36	11.268	11 30 7.3	71.33	2 3.5
18	13 53 59.14	11.300	11 58 31.7	70.69	2 4.1
19	13 58 30.68	11.332	12 26 40.4	70.03	2 4.7
20	14 3 3.01	11.365	12 54 32.9	69.33	2 5.3
21	14 7 36.15	11.399	13 22 8.4	68.62	2 5.9
22	14 12 10.13	11.435	13 49 26.3	67.87	2 6.5
23	14 16 44.98	11.471	14 16 25.8	67.08	2 7.1
24	14 21 20.73	11.509	14 43 6.0	66.27	2 7.8
25	14 25 57.41	11.548	15 9 26.3	65.43	2 8.4
26	14 30 35.03	11.588	15 35 26.1	64.56	2 9.1
27	14 35 13.62	11.629	16 1 4.6	63.65	2 9.8
28	14 39 53.21	11.671	16 26 21.0	62.71	2 10.5
29	14 44 33.82	11.714	16 51 14.7	61.76	2 11.2
30	14 49 15.46	11.757	17 15 45.0	60.77	2 11.9
31	14 53 58.13	11.801	17 39 51.1	59.74	2 12.7
32	14 58 41.86	+11.845	−18 3 32.2	−58.68	2 13.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter	6″.3	6″.4	6″.6	6″.8	6″.9	7″.1
Hor. Parallax	6.5	6.7	6.8	7.0	7.2	7.4

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	14 53 58.13	+11.801	−17 39 51.1	−59.74	2 12.7
2	14 58 41.86	11.845	18 3 32.2	58.68	2 13.5
3	15 3 26.66	11.890	18 26 47.7	57.60	2 14.3
4	15 8 12.54	11.935	18 49 36.7	56.48	2 15.1
5	15 12 59.49	11.979	19 11 58.6	55.33	2 15.9
6	15 17 47.52	12.024	19 33 52.6	54.16	2 16.8
7	15 22 36.63	12.069	19 55 18.0	52.96	2 17.7
8	15 27 26.81	12.113	20 16 14.1	51.73	2 18.6
9	15 32 18.04	12.157	20 36 40.2	50.46	2 19.5
10	15 37 10.33	12.200	20 56 35.6	49.16	2 20.5
11	15 42 3.64	12.244	21 15 59.6	47.84	2 21.4
12	15 46 57.97	12.285	21 34 51.3	46.49	2 22.4
13	15 51 53.29	12.326	21 53 10.2	45.10	2 23.4
14	15 56 49.58	12.365	22 10 55.7	43.70	2 24.4
15	16 1 46.82	12.405	22 28 7.2	42.26	2 25.4
16	16 6 44.98	12.443	22 44 44.0	40.81	2 26.5
17	16 11 44.03	12.479	23 0 45.5	39.33	2 27.5
18	16 16 43.93	12.513	23 16 11.2	37.82	2 28.6
19	16 21 44.64	12.546	23 31 0.4	36.28	2 29.6
20	16 26 46.13	12.578	23 45 12.6	34.74	2 30.7
21	16 31 48.36	12.607	23 58 47.3	33.16	2 31.8
22	16 36 51.27	12.636	24 11 44.1	31.58	2 32.9
23	16 41 54.84	12.662	24 24 2.4	29.96	2 34.0
24	16 46 59.01	12.687	24 35 41.8	28.32	2 35.2
25	16 52 3.74	12.709	24 46 41.9	26.68	2 36.3
26	16 57 9.00	12.730	24 57 2.2	25.01	2 37.5
27	17 2 14.70	12.747	25 6 42.2	23.33	2 38.6
28	17 7 20.80	12.762	25 15 41.7	21.64	2 39.7
29	17 12 27.23	12.775	25 24 0.6	19.93	2 40.8
30	17 17 33.95	12.785	25 31 38.3	18.20	2 42.0
31	17 22 40.88	12.793	25 38 34.6	16.47	2 43.1
32	17 27 47.96	+12.798	−25 44 49.2	−14.74	2 44.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter	7″.3	7″.5	7″.8	8″.0	8″.3	8″.6
Hor. Parallax	7.6	7.8	8.1	8.3	8.6	8.9

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 27 47.96	+12.798	−25 44 49.2	−14.74	2 44.3
2	17 32 55.12	12.799	25 50 21.8	12.99	2 45.5
3	17 38 2.29	12.798	25 55 12.3	11.23	2 46.7
4	17 43 9.39	12.794	25 59 20.6	9.46	2 47.9
5	17 48 16.34	12.786	26 2 46.6	7.70	2 49.1
6	17 53 23.08	12.775	26 5 30.1	5.93	2 50.3
7	17 58 29.50	12.761	26 7 31.1	4.16	2 51.5
8	18 3 35.54	12.742	26 8 49.7	2.39	2 52.7
9	18 8 41.10	12.721	26 9 25.8	− 0.62	2 53.8
10	18 13 46.10	12.696	26 9 19.6	+ 1.14	2 54.9
11	18 18 50.46	12.667	26 8 30.9	2.91	2 56.0
12	18 23 54.09	12.634	26 7 0.1	4.68	2 57.1
13	18 28 56.91	12.599	26 4 47.4	6.41	2 58.2
14	18 33 58.82	12.560	26 1 52.9	8.14	2 59.3
15	18 38 59.73	12.518	25 58 16.8	9.87	3 0.4
16	18 43 59.57	12.472	25 53 59.6	11.57	3 1.5
17	18 48 58.28	12.422	25 49 1.6	13.26	3 2.5
18	18 53 55.75	12.369	25 43 23.0	14.94	3 3.5
19	18 58 51.90	12.312	25 37 4.4	16.61	3 4.5
20	19 3 46.68	12.252	25 30 6.0	18.26	3 5.5
21	19 8 39.99	12.190	25 22 28.3	19.89	3 6.4
22	19 13 31.77	12.125	25 14 11.8	21.49	3 7.3
23	19 18 21.94	12.057	25 5 17.0	23.08	3 8.2
24	19 23 10.46	11.986	24 55 44.3	24.64	3 9.1
25	19 27 57.23	11.912	24 45 34.4	26.19	3 10.0
26	19 32 42.20	11.836	24 34 47.8	27.70	3 10.8
27	19 37 25.31	11.756	24 23 25.1	29.20	3 11.5
28	19 42 6.49	11.675	24 11 26.8	30.66	3 12.3
29	19 46 45.68	11.591	23 58 53.7	32.11	3 13.0
30	19 51 22.82	11.504	23 45 46.3	33.51	3 13.7
31	19 55 57.83	11.415	23 32 5.5	34.90	3 14.3
32	20 0 30.67	+11.322	−23 17 51.9	+36.25	3 14.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	8″.9	9″.2	9″.6	10″.0	10″.5	11″.0
Hor. Parallax	9.2	9.6	10.0	10.4	10.9	11.4

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 55 57.83	+11.415	−23 32 5.5	+34.90	3 14.3
2	20 0 30.67	11.322	23 17 51.9	36.25	3 14.9
3	20 5 1.29	11.228	23 3 6.1	37.56	3 15.4
4	20 9 29.60	11.131	22 47 49.1	38.85	3 15.9
5	20 13 55.56	11.032	22 32 1.4	40.11	3 16.4
6	20 18 19.11	10.931	22 15 44.0	41.33	3 16.8
7	20 22 40.18	10.826	21 58 57.8	42.52	3 17.2
8	20 26 58.71	10.719	21 41 43.5	43.67	3 17.6
9	20 31 14.64	10.609	21 24 2.1	44.78	3 18.0
10	20 35 27.90	10.497	21 5 54.4	45.86	3 18.3
11	20 39 38.43	10.382	20 47 21.4	46.90	3 18.5
12	20 43 46.18	10.265	20 28 23.9	47.90	3 18.7
13	20 47 51.09	10.146	20 9 3.0	48.85	3 18.8
14	20 51 53.09	10.023	19 49 19.5	49.77	3 18.9
15	20 55 52.13	9.898	19 29 14.5	50.65	3 18.9
16	20 59 48.15	9.771	19 8 46.9	51.49	3 18.9
17	21 3 41.08	9.641	18 48 3.7	52.28	3 18.8
18	21 7 30.87	9.509	18 26 59.9	53.04	3 18.7
19	21 11 17.47	9.374	18 5 38.3	53.76	3 18.5
20	21 15 0.81	9.238	17 43 59.9	54.44	3 18.3
21	21 18 40.84	9.098	17 22 5.8	55.08	3 18.1
22	21 22 17.50	8.957	16 59 57.0	55.67	3 17.7
23	21 25 50.73	8.813	16 37 34.6	56.21	3 17.3
24	21 29 20.47	8.665	16 14 59.6	56.71	3 16.8
25	21 32 46.64	8.515	15 52 12.8	57.18	3 16.3
26	21 36 9.18	8.362	15 29 15.5	57.60	3 15.7
27	21 39 28.03	8.207	15 6 8.5	57.98	3 15.1
28	21 42 43.10	8.048	14 42 53.1	58.31	3 14.4
29	21 45 54.30	7.886	14 19 30.1	58.60	3 13.7
30	21 49 1.56	7.720	13 56 0.8	58.84	3 12.8
31	21 52 4.80	7.550	13 32 26.5	59.03	3 11.9
32	21 55 3.92	+ 7.376	−13 8 48.1	+59.17	3 10.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter	11″.5	12″.2	12″.9	13″.6	14″.5	15″.4	16″.5
Hor. Parallax	12.0	12.6	13.3	14.1	15.0	16.0	17.1

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

MARS, 1877.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 16 36.70	+6.574	−17 32 14.3	−26.71	20 30.5
2	15 19 14.66	6.588	17 42 51.5	26.39	20 29.2
3	15 21 52.96	6.603	17 53 21.0	26.07	20 27.9
4	15 24 31.60	6.617	18 3 42.8	25.74	20 26.6
5	15 27 10.58	6.631	18 13 56.8	25.41	20 25.3
6	15 29 49.90	6.646	18 24 2.7	25.08	20 24.0
7	15 32 29.56	6.660	18 34 0.5	24.74	20 22.8
8	15 35 9.56	6.673	18 43 50.2	24.39	20 21.5
9	15 37 49.89	6.686	18 53 31.5	24.04	20 20.3
10	15 40 30.55	6.700	19 3 4.4	23.69	20 19.0
11	15 43 11.53	6.714	19 12 28.9	23.34	20 17.8
12	15 45 52.84	6.727	19 21 44.7	22.98	20 16.5
13	15 48 34.47	6.740	19 30 51.9	22.62	20 15.3
14	15 51 16.41	6.753	19 39 50.3	22.25	20 14.0
15	15 53 58.66	6.766	19 48 39.8	21.88	20 12.8
16	15 56 41.21	6.779	19 57 20.4	21.50	20 11.6
17	15 59 24.04	6.792	20 5 51.9	21.12	20 10.3
18	16 2 7.18	6.804	20 14 14.3	20.73	20 9.1
19	16 4 50.61	6.816	20 22 27.6	20.35	20 7.9
20	16 7 34.33	6.827	20 30 31.5	19.97	20 6.7
21	16 10 18.33	6.839	20 38 26.0	19.58	20 5.5
22	16 13 2.62	6.850	20 46 11.1	19.19	20 4.3
23	16 15 47.19	6.864	20 53 46.8	18.79	20 3.1
24	16 18 32.04	6.875	21 1 12.9	18.38	20 1.9
25	16 21 17.17	6.887	21 8 29.3	17.98	20 0.7
26	16 24 2.57	6.898	21 15 36.2	17.58	19 59.5
27	16 26 48.24	6.909	21 22 33.3	17.17	19 58.4
28	16 29 34.17	6.920	21 29 20.5	16.77	19 57.2
29	16 32 20.37	6.931	21 35 57.9	16.35	19 56.0
30	16 35 6.84	6.941	21 42 25.3	15.93	19 54.9
31	16 37 53.56	6.952	21 48 42.7	15.52	19 53.7
32	16 40 40.53	+6.962	−21 54 50.1	−15.10	19 52.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	2″.5	2″.5	2″.6	2″.7	2″.7	2″.8	2″.8
Hor. Parallax	4.3	4.4	4.5	4.6	4.7	4.8	4.9

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 40 49.53	+6.962	−21 54 50.1	−15.10	19 52.5
2	16 43 27.75	6.972	22 0 47.3	14.67	19 51.4
3	16 46 15.21	6.982	22 6 34.3	14.24	19 50.2
4	16 49 2.89	6.991	22 12 11.0	13.81	19 49.1
5	16 51 50.80	7.001	22 17 37.4	13.38	19 47.9
6	16 54 38.93	7.010	22 22 53.4	12.95	19 46.8
7	16 57 27.27	7.018	22 27 59.0	12.51	19 45.7
8	17 0 15.80	7.025	22 32 54.0	12.07	19 44.6
9	17 3 4.51	7.033	22 37 38.5	11.63	19 43.4
10	17 5 53.40	7.040	22 42 12.3	11.19	19 42.3
11	17 8 42.46	7.047	22 46 35.4	10.74	19 41.2
12	17 11 31.67	7.054	22 50 47.9	10.30	19 40.0
13	17 14 21.01	7.060	22 54 49.7	9.85	19 38.9
14	17 17 10.49	7.064	22 58 40.8	9.41	19 37.8
15	17 20 0.09	7.069	23 2 21.1	8.96	19 36.7
16	17 22 49.83	7.074	23 5 50.6	8.50	19 35.6
17	17 25 39.67	7.078	23 9 9.2	8.05	19 34.5
18	17 28 29.61	7.082	23 12 17.0	7.60	19 33.4
19	17 31 19.65	7.086	23 15 14.0	7.15	19 32.3
20	17 34 9.77	7.089	23 18 0.1	6.70	19 31.2
21	17 36 59.96	7.092	23 20 35.3	6.24	19 30.1
22	17 39 50.23	7.095	23 22 59.7	5.79	19 29.0
23	17 42 40.57	7.098	23 25 13.3	5.34	19 27.9
24	17 45 30.97	7.101	23 27 16.0	4.89	19 26.8
25	17 48 21.43	7.103	23 29 7.8	4.44	19 25.7
26	17 51 11.93	7.105	23 30 48.7	3.98	19 24.6
27	17 54 2.47	7.107	23 32 18.7	3.52	19 23.5
28	17 56 53.05	7.108	23 33 37.7	3.07	19 22.4
29	17 59 43.66	7.109	23 34 45.8	2.61	19 21.3
30	18 2 34.28	7.109	23 35 43.0	2.16	19 20.2
31	18 5 24.90	7.109	23 36 29.3	1.71	19 19.1
32	18 8 15.52	+7.108	−23 37 4.7	−1.26	19 18.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	2″.9	3″.0	3″.1	3″.1	3″.2
Hor. Parallax	5.1	5.2	5.3	5.5	5.7

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 59 43.66	+7.109	−23 34 45.8	− 2.61	19 21.3
2	18 2 34.28	7.109	23 35 43.0	2.16	19 20.2
3	18 5 24.90	7.109	23 36 29.3	1.71	19 19.1
4	18 8 15.52	7.108	23 37 4.7	1.26	19 18.0
5	18 11 6.12	7.107	23 37 29.2	0.80	19 16.9
6	18 13 56.70	7.106	23 37 42.8	− 0.35	19 15.8
7	18 16 47.23	7.104	23 37 45.6	+ 0.10	19 14.7
8	18 19 37.71	7.102	23 37 37.7	0.55	19 13.6
9	18 22 28.12	7.099	23 37 18.9	1.00	19 12.5
10	18 25 18.45	7.095	23 36 49.3	1.45	19 11.4
11	18 28 8.69	7.090	23 36 9.0	1.89	19 10.3
12	18 30 58.82	7.086	23 35 18.1	2.34	19 9.1
13	18 33 48.83	7.080	23 34 16.5	2.78	19 8.0
14	18 36 38.71	7.075	23 33 4.4	3.22	19 6.9
15	18 39 28.46	7.069	23 31 41.7	3.66	19 5.8
16	18 42 18.05	7.063	23 30 8.6	4.09	19 4.7
17	18 45 7.47	7.056	23 28 25.1	4.51	19 3.6
18	18 47 56.72	7.048	23 26 31.3	4.94	19 2.5
19	18 50 45.78	7.040	23 24 27.3	5.37	19 1.3
20	18 53 34.64	7.032	23 22 13.0	5.79	19 0.2
21	18 56 23.30	7.024	23 19 48.6	6.22	18 59.1
22	18 59 11.76	7.015	23 17 14.2	6.64	18 57.9
23	19 2 0.01	7.006	23 14 29.8	7.05	18 56.8
24	19 4 48.05	6.997	23 11 35.5	7.47	18 55.6
25	19 7 35.87	6.987	23 8 31.2	7.88	18 54.5
26	19 10 23.45	6.977	23 5 17.1	8.29	18 53.3
27	19 13 10.80	6.967	23 1 53.3	8.70	18 52.2
28	19 15 57.90	6.956	22 58 19.9	9.10	18 51.0
29	19 18 44.75	6.946	22 54 36.9	9.49	18 49.9
30	19 21 31.34	6.936	22 50 44.4	9.89	18 48.7
31	19 24 17.66	6.925	22 46 42.4	10.28	18 47.5
32	19 27 3.71	+6.913	−22 42 31.2	+10.66	18 46.3

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	3″.3	3″.4	3″.5	3″.6	3″.7	3″.9
Hor. Parallax	5.8	6.0	6.2	6.4	6.6	6.8

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 27 3.71	+6.913	−22 42 31.2	+10.66	18 46.3
2	19 29 49.47	6.901	22 38 10.8	11.04	18 45.1
3	19 32 34.92	6.888	22 33 41.2	11.42	18 44.0
4	19 35 20.06	6.874	22 29 2.6	11.79	18 42.8
5	19 38 4.89	6.860	22 24 15.1	12.16	18 41.6
6	19 40 49.37	6.846	22 19 18.8	12.52	18 40.4
7	19 43 33.51	6.831	22 14 13.9	12.88	18 39.2
8	19 46 17.28	6.815	22 9 0.5	13.24	18 37.9
9	19 49 0.67	6.799	22 3 38.8	13.58	18 36.7
10	19 51 43.66	6.783	21 58 8.8	13.92	18 35.5
11	19 54 26.26	6.767	21 52 30.6	14.26	18 34.3
12	19 57 8.45	6.749	21 46 44.5	14.59	18 33.0
13	19 59 50.22	6.731	21 40 50.5	14.91	18 31.8
14	20 2 31.57	6.713	21 34 48.7	15.23	18 30.5
15	20 5 12.48	6.695	21 28 39.4	15.54	18 29.3
16	20 7 52.94	6.676	21 22 22.7	15.84	18 28.0
17	20 10 32.95	6.657	21 15 58.7	16.14	18 26.7
18	20 13 12.50	6.637	21 9 27.5	16.44	18 25.4
19	20 15 51.58	6.618	21 2 49.4	16.73	18 24.1
20	20 18 30.19	6.598	20 56 4.5	17.01	18 22.8
21	20 21 8.33	6.579	20 49 12.8	17.29	18 21.5
22	20 23 46.00	6.559	20 42 14.5	17.56	18 20.2
23	20 26 23.19	6.539	20 35 9.8	17.83	18 18.8
24	20 28 59.88	6.518	20 27 58.6	18.09	18 17.5
25	20 31 36.09	6.498	20 20 41.2	18.34	18 16.1
26	20 34 11.80	6.477	20 13 17.8	18.59	18 14.8
27	20 36 47.00	6.456	20 5 48.5	18.84	18 13.4
28	20 39 21.70	6.435	19 58 13.4	19.08	18 12.1
29	20 41 55.88	6.414	19 50 32.7	19.31	18 10.7
30	20 44 29.53	6.391	19 42 46.6	19.53	18 9.3
31	20 47 2.64	6.368	19 34 55.2	19.75	18 7.9
32	20 49 35.19	+6.344	−19 26 58.7	+19.96	18 6.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter	4″.0	4″.1	4″.3	4″.4	4″.6	4″.8
Hor. Parallax	7.0	7.2	7.5	7.8	8.1	8.4

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 47 2.64	+6.368	−19 34 55.2	+19.75	18 7.9
2	20 49 35.19	6.344	19 26 58.7	19.96	18 6.5
3	20 52 7.17	6.320	19 18 57.4	20.15	18 5.1
4	20 54 38.57	6.296	19 10 51.5	20.34	18 3.7
5	20 57 9.39	6.271	19 2 41.1	20.52	18 2.2
6	20 59 39.61	6.246	18 54 26.4	20.69	18 0.8
7	21 2 9.22	6.220	18 46 7.6	20.86	17 59.3
8	21 4 38.20	6.194	18 37 45.0	21.02	17 57.9
9	21 7 6.56	6.168	18 29 18.6	21.18	17 56.4
10	21 9 34.26	6.141	18 20 48.8	21.32	17 54.9
11	21 12 1.30	6.112	18 12 15.8	21.44	17 53.4
12	21 14 27.66	6.083	18 3 39.9	21.56	17 51.9
13	21 16 53.32	6.055	17 55 1.3	21.67	17 50.4
14	21 19 18.28	6.025	17 46 20.1	21.77	17 48.8
15	21 21 42.53	5.995	17 37 36.5	21.86	17 47.3
16	21 24 6.07	5.965	17 28 50.7	21.94	17 45.7
17	21 26 28.89	5.935	17 20 3.0	22.02	17 44.1
18	21 28 50.98	5.905	17 11 13.4	22.09	17 42.6
19	21 31 12.34	5.875	17 2 22.2	22.16	17 41.0
20	21 33 32.96	5.844	16 53 29.5	22.22	17 39.4
21	21 35 52.84	5.813	16 44 35.7	22.26	17 37.8
22	21 38 11.95	5.781	16 35 40.8	22.30	17 36.1
23	21 40 30.29	5.748	16 26 45.1	22.33	17 34.5
24	21 42 47.85	5.715	16 17 48.8	22.35	17 32.8
25	21 45 4.63	5.683	16 8 51.9	22.37	17 31.2
26	21 47 20.61	5.649	15 59 54.8	22.38	17 29.5
27	21 49 35.78	5.615	15 50 57.6	22.37	17 27.8
28	21 51 50.13	5.580	15 42 0.7	22.35	17 26.1
29	21 54 3.65	5.545	15 33 4.3	22.33	17 24.3
30	21 56 16.31	5.510	15 24 8.5	22.30	17 22.6
31	21 58 28.11	5.473	15 15 13.7	22.25	17 20.8
32	22 0 39.01	+5.435	−15 6 20.2	+22.18	17 19.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	5″.0	5″.2	5″.4	5″.6	5″.9	6″.1	6″.4
Hor. Parallax	8.7	9.1	9.5	9.9	10.3	10.7	11.2

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	22 0 39.01	+5.435	−15 6 20.2	+22.18	17 19.0
2	22 2 48.99	5.396	14 57 28.3	22.12	17 17.2
3	22 4 58.04	5.356	14 48 38.3	22.04	17 15.5
4	22 7 6.13	5.316	14 39 50.4	21.95	17 13.7
5	22 9 13.23	5.274	14 31 4.7	21.85	17 11.8
6	22 11 19.33	5.232	14 22 21.7	21.73	17 10.0
7	22 13 24.40	5.189	14 13 41.7	21.60	17 8.1
8	22 15 28.42	5.145	14 5 5.0	21.45	17 6.2
9	22 17 31.37	5.099	13 56 32.0	21.29	17 4.3
10	22 19 33.22	5.053	13 48 2.8	21.13	17 2.4
11	22 21 33.94	5.006	13 39 37.5	20.96	17 0.4
12	22 23 33.52	4.958	13 31 16.7	20.76	16 58.5
13	22 25 31.94	4.909	13 23 0.6	20.56	16 56.6
14	22 27 29.18	4.859	13 14 49.5	20.35	16 54.6
15	22 29 25.22	4.809	13 6 43.5	20.14	16 52.6
16	22 31 20.04	4.758	12 58 42.9	19.91	16 50.6
17	22 33 13.63	4.706	12 50 47.7	19.67	16 48.5
18	22 35 5.95	4.653	12 42 58.2	19.42	16 46.4
19	22 36 56.99	4.598	12 35 14.8	19.17	16 44.3
20	22 38 46.72	4.543	12 27 37.7	18.90	16 42.2
21	22 40 35.12	4.487	12 20 7.3	18.62	16 40.0
22	22 42 22.16	4.430	12 12 43.8	18.32	16 37.9
23	22 44 7.83	4.373	12 5 27.4	18.02	16 35.7
24	22 45 52.09	4.314	11 58 18.4	17.71	16 33.4
25	22 47 34.91	4.253	11 51 17.0	17.39	16 31.2
26	22 49 16.26	4.192	11 44 23.5	17.05	16 28.9
27	22 50 56.11	4.128	11 37 38.2	16.70	16 26.6
28	22 52 34.42	4.063	11 31 1.5	16.34	16 24.3
29	22 54 11.14	3.995	11 24 33.8	15.96	16 21.9
30	22 55 46.22	3.926	11 18 15.5	15.56	16 19.5
31	22 57 19.63	3.855	11 12 6.9	15.15	16 17.1
32	22 58 51.33	+3.783	−11 6 8.3	+14.73	16 14.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter	6″.7	7″.0	7″.3	7″.7	8″.1	8″.5
Hor. Parallax	11.7	12.2	12.8	13.5	14.2	14.8

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	22 57 19.63	+3.855	−11 12 6.9	+15.15	16 17.1
2	22 58 51.33	3.783	11 6 8.3	14.73	16 14.7
3	23 0 21.28	3.709	11 0 19.8	14.29	16 12.2
4	23 1 49.42	3.633	10 54 42.0	13.83	16 9.7
5	23 3 15.71	3.556	10 49 15.5	13.36	16 7.2
6	23 4 40.11	3.476	10 44 0.5	12.88	16 4.6
7	23 6 2.55	3.394	10 38 57.1	12.38	16 2.0
8	23 7 22.99	3.310	10 34 5.8	11.89	15 59.4
9	23 8 41.38	3.223	10 29 26.8	11.36	15 56.8
10	23 9 57.69	3.136	10 25 0.3	10.83	15 54.1
11	23 11 11.88	3.046	10 20 46.5	10.29	15 51.4
12	23 12 23.88	2.955	10 16 45.8	9.75	15 48.6
13	23 13 33.68	2.862	10 12 58.3	9.19	15 45.8
14	23 14 41.23	2.767	10 9 24.4	8.62	15 43.0
15	23 15 46.48	2.671	10 6 4.2	8.04	15 40.1
16	23 16 49.41	2.573	10 2 57.9	7.46	15 37.2
17	23 17 49.96	2.473	10 0 5.6	6.88	15 34.2
18	23 18 48.10	2.371	9 57 27.4	6.29	15 31.2
19	23 19 43.79	2.269	9 55 3.4	5.70	15 28.2
20	23 20 36.99	2.164	9 52 53.8	5.09	15 25.1
21	23 21 27.65	2.057	9 50 59.0	4.47	15 22.0
22	23 22 15.73	1.949	9 49 19.0	3.84	15 18.8
23	23 23 1.18	1.838	9 47 54.1	3.22	15 15.6
24	23 23 43.95	1.725	9 46 44.4	2.58	15 12.3
25	23 24 24.00	1.611	9 45 50.0	1.95	15 9.0
26	23 25 1.28	1.495	9 45 11.0	1.31	15 5.7
27	23 25 35.75	1.376	9 44 47.4	+ 0.66	15 2.3
28	23 26 7.37	1.256	9 44 39.5	0.00	14 58.9
29	23 26 36.07	1.134	9 44 47.4	− 0.66	14 55.4
30	23 27 1.82	1.011	9 45 11.2	1.32	14 51.9
31	23 27 24.57	0.884	9 45 51.1	1.98	14 48.3
32	23 27 44.26	+0.756	− 9 46 47.0	− 2.65	14 44.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter	8″.9	9″.3	9″.7	10″.2	10″.7	11″.2
Hor. Parallax	15.5	16.3	17.1	17.9	18.7	19.6

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 27 44.26	+0.756	− 9 46 47.0	− 2.65	14 44.6
2	23 28 0.85	0.626	9 47 58.9	3.32	14 40.9
3	23 28 14.31	0.495	9 49 26.7	3.98	14 37.2
4	23 28 24.62	0.363	9 51 10.3	4.63	14 33.4
5	23 28 31.75	0.231	9 53 9.4	5.27	14 29.6
6	23 28 35.68	+0.097	9 55 23.8	5.90	14 25.7
7	23 28 36.42	−0.035	9 57 53.2	6.53	14 21.7
8	23 28 33.98	0.167	10 0 37.3	7.13	14 17.7
9	23 28 28.34	0.300	10 3 35.6	7.71	14 13.7
10	23 28 19.52	0.433	10 6 47.8	8.27	14 9.6
11	23 28 7.52	0.565	10 10 13.1	8.81	14 5.4
12	23 27 52.38	0.695	10 13 51.0	9.30	14 1.2
13	23 27 34.13	0.824	10 17 41.0	9.81	13 56.9
14	23 27 12.82	0.951	10 21 42.4	10.27	13 52.6
15	23 26 48.48	1.075	10 25 54.5	10.70	13 48.2
16	23 26 21.20	1.197	10 30 16.4	11.09	13 33.8
17	23 25 51.03	1.315	10 34 47.2	11.45	13 39.4
18	23 25 18.02	1.431	10 39 26.2	11.77	13 35.0
19	23 24 42.26	1.544	10 44 12.4	12.06	13 30.5
20	23 24 3.85	1.654	10 49 5.0	12.31	13 25.9
21	23 23 22.85	1.760	10 54 3.3	12.53	13 21.2
22	23 22 39.36	1.862	10 59 6.7	12.72	13 16.4
23	23 21 53.47	1.959	11 4 14.1	12.88	13 11.7
24	23 21 5.29	2.052	11 9 24.8	12.99	13 7.0
25	23 20 14.92	2.141	11 14 37.8	13.07	13 2.2
26	23 19 22.49	2.225	11 19 52.1	13.10	12 57.4
27	23 18 28.09	2.303	11 25 6.5	13.08	12 52.5
28	23 17 31.88	2.376	11 30 20.0	13.02	12 47.6
29	23 16 33.98	2.443	11 35 31.5	12.92	12 42.7
30	23 15 34.56	2.504	11 40 39.8	12.77	12 37.8
31	23 14 33.77	2.558	11 45 44.2	12.58	12 32.9
32	23 13 31.79	−2.604	−11 50 43.5	−12.34	12 27.9

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter	11″.7	12″.2	12″.6	13″.0	13″.2	13″.4
Hor. Parallax	20.5	21.3	22.0	22.6	23.1	23.4

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

MARS, 1877.

GREENWICH MEAN TIME.

	SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	23 13 31.79	−2.604	−11 50 43.5	−12.34	12 27.9	1	22 47 49.39	−0.821	−12 30 29.3	+ 8.13	10 4.7
2	23 12 28.77	2.643	11 55 36.7	12.06	12 22.9	2	22 47 31.16	0.696	12 27 4.6	8.91	10 0.5
3	23 11 24.90	2.675	12 0 22.6	11.73	12 17.9	3	22 47 15.91	0.573	12 23 21.6	9.67	9 56.4
4	23 10 20.36	2.698	12 4 59.8	11.35	12 12.9	4	22 47 3.67	0.447	12 19 20.2	10.42	9 52.3
5	23 9 15.34	2.714	12 9 27.4	10.91	12 7.9	5	22 46 54.45	0.321	12 15 0.6	11.19	9 48.2
6	23 8 10.04	2.722	12 13 44.3	10.46	12 2.9	6	22 46 48.27	0.194	12 10 23.0	11.94	9 44.2
7	23 7 4.65	2.721	12 17 49.6	9.95	11 57.8	7	22 46 45.13	−0.067	12 5 27.5	12.67	9 40.2
8	23 5 59.39	2.711	12 21 42.2	9.41	11 52.8	8	22 46 45.05	+0.060	12 0 14.7	13.38	9 36.3
9	23 4 54.45	2.694	12 25 21.3	8.82	11 47.8	9	22 46 48.01	0.186	11 54 45.0	14.09	9 32.4
10	23 3 50.03	2.669	12 28 45.8	8.20	11 42.8	10	22 46 54.00	0.312	11 48 58.5	14.78	9 28.6
11	23 2 46.32	2.635	12 31 54.9	7.54	11 37.9	11	22 47 3.02	0.437	11 42 55.6	15.46	9 24.8
12	23 1 43.52	2.593	12 34 47.7	7.85	11 32.9	12	22 47 15.03	0.561	11 36 36.6	16.12	9 21.1
13	23 0 41.79	2.545	12 37 23.6	6.13	11 28.0	13	22 47 30.00	0.684	11 30 1.6	16.76	9 17.5
14	22 59 41.32	2.490	12 39 42.1	5.39	11 23.0	14	22 47 47.91	0.805	11 23 11.2	17.41	9 13.9
15	22 58 42.25	2.427	12 41 42.8	4.63	11 18.1	15	22 48 8.70	0.925	11 16 5.7	18.02	9 10.3
16	22 57 44.77	2.359	12 43 25.0	3.87	11 13.3	16	22 48 32.32	1.042	11 8 45.5	18.63	9 6.7
17	22 56 49.00	2.284	12 44 48.4	3.09	11 8.4	17	22 48 58.75	1.158	11 1 11.1	19.22	9 3.3
18	22 55 55.10	2.204	12 45 52.9	2.28	11 3.6	18	22 49 27.92	1.271	10 53 22.7	19.80	8 59.9
19	22 55 3.16	2.120	12 46 38.2	1.49	10 58.9	19	22 49 59.78	1.382	10 45 20.8	20.35	8 56.5
20	22 54 13.33	2.031	12 47 4.2	− 0.69	10 54.2	20	22 50 34.27	1.491	10 37 6.0	20.89	8 53.1
21	22 53 25.70	1.937	12 47 10.8	+ 0.12	10 49.5	21	22 51 11.35	1.597	10 28 38.4	21.41	8 49.8
22	22 52 40.38	1.839	12 46 57.9	0.93	10 44.8	22	22 51 50.97	1.702	10 19 58.4	21.91	8 46.6
23	22 51 57.45	1.736	12 46 25.5	1.74	10 40.1	23	22 52 33.07	1.804	10 11 6.2	22.41	8 43.4
24	22 51 17.01	1.631	12 45 33.5	2.56	10 35.6	24	22 53 17.58	1.904	10 2 2.2	22.90	8 40.2
25	22 50 39.14	1.524	12 44 22.1	3.37	10 31.1	25	22 54 4.48	2.002	9 52 46.6	23.36	8 37.0
26	22 50 3.90	1.413	12 42 51.3	4.18	10 26.6	26	22 54 53.69	2.098	9 43 19.6	23.86	8 33.9
27	22 49 31.36	1.299	12 41 1.1	4.98	10 22.2	27	22 55 45.18	2.192	9 33 41.6	24.30	8 30.9
28	22 49 1.59	1.182	12 38 51.6	5.79	10 17.8	28	22 56 38.91	2.285	9 23 52.9	24.74	8 27.8
29	22 48 34.64	1.063	12 36 23.0	5.58	10 13.4	29	22 57 34.84	2.375	9 13 53.6	25.16	8 24.8
30	22 48 10.56	0.943	12 33 35.5	7.36	10 9.1	30	22 58 32.92	2.463	9 3 44.0	25.61	8 21.9
31	22 47 49.39	0.821	12 30 29.3	8.13	10 4.7	31	22 59 33.11	2.550	8 53 24.3	26.03	8 18.9
32	22 47 31.16	−0.696	−12 27 4.6	+ 8.91	10 0.5	32	23 0 35.35	+2.635	− 8 42 54.7	+26.44	8 16.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter	13″.4	13″.3	13″.1	12″.8	12″.4	11″.9	Semidiameter	11″.4	10″.9	10″.4	9″.8	9″.3	8″.8
Hor. Parallax	23.4	23.3	22.9	22.4	21.7	20.8	Hor. Parallax	19.9	19.0	18.0	17.1	16.2	15.3

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 0 35.35	+2.635	−8 42 54.7	+26.44	8 16.1
2	23 1 39.61	2.718	8 32 15.4	26.84	8 13.2
3	23 2 45.86	2.800	8 21 26.4	27.24	8 10.4
4	23 3 54.05	2.880	8 10 27.9	27.63	8 7.6
5	23 5 4.13	2.958	7 59 20.2	28.01	8 4.8
6	23 6 16.07	3.035	7 48 3.4	28.38	8 2.1
7	23 7 29.82	3.110	7 36 37.8	28.75	7 59.4
8	23 8 45.35	3.182	7 25 3.7	29.10	7 56.8
9	23 10 2.61	3.253	7 13 21.3	29.44	7 54.1
10	23 11 21.54	3.322	7 1 30.7	29.77	7 51.5
11	23 12 42.11	3.389	6 49 32.1	30.10	7 48.9
12	23 14 4.26	3.455	6 37 25.9	30.41	7 46.3
13	23 15 27.95	3.519	6 25 12.2	30.72	7 43.8
14	23 16 53.14	3.580	6 12 51.2	31.02	7 41.3
15	23 18 19.80	3.640	6 0 23.3	31.30	7 38.8
16	23 19 47.88	3.699	5 47 48.8	31.57	7 36.3
17	23 21 17.33	3.755	5 35 7.8	31.83	7 33.9
18	23 22 48.12	3.809	5 22 20.5	32.09	7 31.5
19	23 24 20.20	3.863	5 9 27.2	32.35	7 29.1
20	23 25 53.53	3.914	4 56 28.0	32.59	7 26.7
21	23 27 28.06	3.964	4 43 23.1	32.83	7 24.3
22	23 29 3.82	4.013	4 30 12.6	33.05	7 22.0
23	23 30 40.71	4.060	4 16 56.7	33.27	7 19.7
24	23 32 18.72	4.107	4 3 35.6	33.48	7 17.4
25	23 33 57.83	4.153	3 50 9.4	33.69	7 15.1
26	23 35 38.03	4.197	3 36 38.4	33.90	7 12.9
27	23 37 19.28	4.240	3 23 2.5	34.10	7 10.6
28	23 39 1.55	4.282	3 9 21.8	34.29	7 8.4
29	23 40 44.84	4.324	2 55 36.6	34.47	7 6.2
30	23 42 29.11	4.365	2 41 47.1	34.66	7 4.0
31	23 44 14.36	4.405	2 27 53.3	34.83	7 1.8
32	23 46 0.56	+4.444	−2 13 55.2	+35.00	6 59.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	8″.3	7″.8	7″.4	7″.1	6″.7	6″.4
Hor. Parallax	14.5	13.7	13.0	12.4	11.8	11.2

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 44 14.36	+4.405	−2 27 53.3	+34.83	7 1.8
2	23 46 0.56	4.444	2 13 55.2	35.00	6 59.7
3	23 47 47.70	4.484	1 59 53.1	35.18	6 57.5
4	23 49 35.75	4.522	1 45 47.1	35.34	6 55.4
5	23 51 24.70	4.558	1 31 37.3	35.49	6 53.2
6	23 53 14.53	4.594	1 17 24.0	35.63	6 51.1
7	23 55 5.22	4.630	1 3 7.1	35.77	6 49.0
8	23 56 56.74	4.664	0 48 46.8	35.91	6 47.0
9	23 58 49.09	4.697	0 34 23.2	36.04	6 44.9
10	0 0 42.24	4.730	0 19 56.6	36.16	6 42.9
11	0 2 36.16	4.762	−0 5 27.2	36.28	6 40.8
12	0 4 30.84	4.794	+0 9 4.7	36.38	6 38.8
13	0 6 26.25	4.823	0 23 39.1	36.48	6 36.8
14	0 8 22.36	4.852	0 38 15.6	36.57	6 34.8
15	0 10 19.16	4.881	0 52 54.2	36.65	6 32.8
16	0 12 16.65	4.909	1 7 34.9	36.73	6 30.8
17	0 14 14.81	4.936	1 22 17.4	36.80	6 28.8
18	0 16 13.62	4.963	1 37 1.4	36.86	6 26.9
19	0 18 13.07	4.990	1 51 46.9	36.92	6 24.9
20	0 20 13.13	5.016	2 6 33.6	36.97	6 23.0
21	0 22 13.81	5.041	2 21 21.5	37.01	6 21.0
22	0 24 15.07	5.065	2 36 10.5	37.05	6 19.1
23	0 26 16.92	5.089	2 51 0.4	37.09	6 17.2
24	0 28 19.36	5.113	3 5 51.1	37.12	6 15.3
25	0 30 22.36	5.137	3 20 42.4	37.15	6 13.5
26	0 32 25.94	5.161	3 35 34.3	37.17	6 11.6
27	0 34 30.09	5.184	3 50 26.7	37.19	6 9.7
28	0 36 34.79	5.207	4 5 19.4	37.21	6 7.9
29	0 38 40.05	5.230	4 20 12.5	37.22	6 6.0
30	0 40 45.85	5.253	4 35 5.8	37.22	6 4.2
31	0 42 52.19	5.275	4 59 59.1	37.21	6 2.3
32	0 44 59.06	+5.297	+5 4 52.2	+37.20	6 0.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	6″.1	5″.8	5″.5	5″.3	5″.0	4″.8
Hor. Parallax	10.6	10.1	9.6	9.2	8.8	8.4

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 12 43.49	+2.347	−22 33 15.6	−2.81	22 25.0
2	17 13 39.75	2.341	22 34 22.2	2.75	22 22.0
3	17 14 35.87	2.335	22 35 27.4	2.69	22 19.0
4	17 15 31.83	2.329	22 36 31.2	2.63	22 16.0
5	17 16 27.63	2.322	22 37 33.5	2.57	22 13.0
6	17 17 23.28	2.315	22 38 34.3	2.51	22 10.0
7	17 18 18.76	2.308	22 39 33.7	2.45	22 7.0
8	17 19 14.05	2.300	22 40 31.7	2.39	22 4.0
9	17 20 9.16	2.292	22 41 28.2	2.33	22 1.0
10	17 21 4.07	2.284	22 42 23.3	2.27	21 57.9
11	17 21 58.78	2.275	22 43 17.0	2.21	21 54.9
12	17 22 53.29	2.266	22 44 9.2	2.15	21 51.8
13	17 23 47.58	2.257	22 45 0.0	2.09	21 48.8
14	17 24 41.65	2.248	22 45 49.4	2.03	21 45.7
15	17 25 35.49	2.238	22 46 37.4	1.97	21 42.7
16	17 26 29.08	2.228	22 47 24.0	1.91	21 39.6
17	17 27 22.42	2.218	22 48 9.2	1.85	21 36.6
18	17 28 15.52	2.207	22 48 53.1	1.80	21 33.5
19	17 29 8.36	2.196	22 49 35.6	1.74	21 30.5
20	17 30 0.93	2.185	22 50 16.7	1.68	21 27.4
21	17 30 53.22	2.173	22 50 56.5	1.63	21 24.4
22	17 31 45.22	2.161	22 51 34.9	1.57	21 21.3
23	17 32 36.93	2.149	22 52 12.1	1.52	21 18.2
24	17 33 28.35	2.136	22 52 48.0	1.47	21 15.2
25	17 34 19.47	2.123	22 53 22.6	1.42	21 12.1
26	17 35 10.28	2.110	22 53 56.0	1.37	21 9.0
27	17 36 0.77	2.097	22 54 28.2	1.32	21 5.9
28	17 36 50.94	2.064	22 54 59.1	1.27	21 2.8
29	17 37 40.79	2.070	22 55 28.8	1.22	20 59.7
30	17 38 30.31	2.056	22 55 57.3	1.17	20 56.5
31	17 39 19.49	2.042	22 56 24.6	1.12	20 53.4
32	17 40 8.31	+2.027	−22 56 50.8	−1.07	20 50.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	15″.2	15″.3	15″.6	15″.9
Horizontal Parallax	1.4	1.4	1.5	1.5

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 40 8.31	+2.027	−22 56 50.8	−1.07	20 50.3
2	17 40 56.79	2.012	22 57 15.9	1.02	20 47.2
3	17 41 44.91	1.997	22 57 39.9	0.97	20 44.0
4	17 42 32.66	1.982	22 58 2.7	0.92	20 40.9
5	17 43 20.04	1.966	22 58 24.4	0.88	20 37.8
6	17 44 7.02	1.950	22 58 45.1	0.84	20 34.6
7	17 44 53.61	1.933	22 59 4.7	0.80	20 31.4
8	17 45 39.81	1.916	22 59 23.3	0.75	20 28.2
9	17 46 25.59	1.899	22 59 40.9	0.71	20 25.0
10	17 47 10.95	1.881	22 59 57.4	0.67	20 21.8
11	17 47 55.89	1.863	23 0 12.9	0.63	20 18.6
12	17 48 40.39	1.845	23 0 27.5	0 59	20 15.4
13	17 49 24.44	1.827	23 0 41.2	0.55	20 12.2
14	17 50 8.06	1.808	23 0 54.0	0.51	20 9.0
15	17 50 51.22	1.789	23 1 6.0	0.48	20 5.8
16	17 51 33.91	1.769	23 1 17.1	0.44	20 2.6
17	17 52 16.13	1.749	23 1 27.3	0.40	19 59.4
18	17 52 57.88	1.729	23 1 36.6	0.37	19 56.1
19	17 53 39.14	1.709	23 1 45.3	0.34	19 52.8
20	17 54 19.90	1.688	23 1 53.2	0.31	19 49.6
21	17 55 0.16	1.667	23 2 0.3	0.28	19 46.3
22	17 55 39.90	1.646	23 2 6.8	0.25	19 43.0
23	17 56 19.13	1.624	23 2 12.6	0.22	19 39.7
24	17 56 57.84	1.602	23 2 17.8	0.20	19 36.4
25	17 57 36.02	1.580	23 2 22.2	0.17	19 33.1
26	17 58 13.67	1.558	23 2 26.0	0.14	19 29.8
27	17 58 50.79	1.535	23 2 29.3	0.12	19 26.5
28	17 59 27.36	1.512	23 2 32.0	0.10	19 23.2
29	18 0 3.38	1.489	23 2 34.3	0.08	19 19.9
30	18 0 38.84	1.465	23 2 36.0	0.06	19 16.5
31	18 1 13.73	1.441	23 2 37.1	0.04	19 13.1
32	18 1 48.05	+1.417	−23 2 37.8	−0.02	19 9.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	15″.9	16″.3	16″.7	17″.1
Horizontal Parallax	1.5	1.5	1.6	1.6

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 0 3.38	+1.489	−23 2 34.3	−0.08	19 19.9	1	18 13 24.38	+0.621	−23 1 25.9	+0.11	17 30.9
2	18 0 38.84	1.465	23 2 36.0	0.06	19 16.5	2	18 13 38.90	0.589	23 1 23.4	0.10	17 27.2
3	18 1 13.73	1.441	23 2 37.1	0.04	19 13.1	3	18 13 52.64	0.557	23 1 21.1	0.10	17 23.5
4	18 1 48.05	1.417	23 2 37.8	−0.02	19 9.7	4	18 14 5.60	0.525	23 1 19.0	0.09	17 19.8
5	18 2 21.77	1.393	23 2 38.0	0.00	19 6.3	5	18 14 17.80	0.492	23 1 17.1	0.08	17 16.1
6	18 2 54.90	1.368	23 2 37.8	+0.02	19 2.9	6	18 14 29.21	0.459	23 1 15.4	0.07	17 12.3
7	18 3 27.42	1.343	23 2 37.2	0.04	18 59.5	7	18 14 39.83	0.426	23 1 14.1	0.06	17 8.5
8	18 3 59.34	1.317	23 2 36.1	0.06	18 56.1	8	18 14 49.66	0.393	23 1 13.1	0.05	17 4.7
9	18 4 30.64	1.291	23 2 34.8	0.07	18 52.7	9	18 14 58.69	0.360	23 1 12.3	0.04	17 0.9
10	18 5 1.32	1.265	23 2 33.2	0.08	18 49.3	10	18 15 6.92	0.326	23 1 11.7	+0.02	16 57.1
11	18 5 31.37	1.239	23 2 31.3	0.09	18 45.8	11	18 15 14.34	0.292	23 1 11.4	0.00	16 53.3
12	18 6 0.78	1.212	23 2 29.1	0.10	18 42.4	12	18 15 20.95	0.258	23 1 11.5	−0.01	16 49.5
13	18 6 29.54	1.185	23 2 26.6	0.11	18 38.9	13	18 15 26.74	0.224	23 1 12.0	0.02	16 45.7
14	18 6 57.65	1.157	23 2 24.0	0.12	18 35.4	14	18 15 31.72	0.190	23 1 12.8	0.04	16 41.8
15	18 7 25.09	1.129	23 2 21.1	0.13	18 31.9	15	18 15 35.88	0.156	23 1 13.9	0.05	16 37.9
16	18 7 51.86	1.101	23 2 18.1	0.13	18 28.4	16	18 15 39.23	0.122	23 1 15.4	0.06	16 34.0
17	18 8 17.96	1.073	23 2 14.9	0.14	18 24.9	17	18 15 41.75	0.088	23 1 17.3	0.08	16 30.1
18	18 8 43.38	1.044	23 2 11.6	0.14	18 21.4	18	18 15 43.45	0.054	23 1 19.5	0.09	16 26.2
19	18 9 8.11	1.015	23 2 8.3	0.14	18 17.9	19	18 15 44.34	+0.020	23 1 22.1	0.11	16 22.3
20	18 9 32.14	0.986	23 2 4.9	0.15	18 14.4	20	18 15 44.41	−0.014	23 1 25.0	0.13	16 18.3
21	18 9 55.47	0.957	23 2 1.4	0.15	18 10.9	21	18 15 43.66	0.048	23 1 28.3	0.15	16 14.4
22	18 10 18.00	0.926	23 1 57.9	0.15	18 7.3	22	18 15 42.10	0.082	23 1 32.0	0.16	16 10.5
23	18 10 40.00	0.896	23 1 54.4	0.15	18 3.7	23	18 15 39.72	0.116	23 1 36.0	0.18	16 6.5
24	18 11 1.20	0.866	23 1 50.9	0.15	18 0.1	24	18 15 36.53	0.150	23 1 40.4	0.19	16 2.5
25	18 11 21.68	0.836	23 1 47.5	0.14	17 56.5	25	18 15 32.54	0.183	23 1 45.2	0.21	15 58.5
26	18 11 41.43	0.806	23 1 44.1	0.14	17 52.9	26	18 15 27.73	0.217	23 1 50.3	0.22	15 54.5
27	18 12 0.45	0.777	23 1 40.8	0.14	17 49.2	27	18 15 22.12	0.251	23 1 55.7	0.24	15 50.5
28	18 12 18.73	0.746	23 1 37.6	0.13	17 45.6	28	18 15 15.70	0.285	23 2 1.5	0.26	15 46.4
29	18 12 36.27	0.715	23 1 34.4	0.13	17 42.0	29	18 15 8.48	0.318	23 2 7.7	0.27	15 42.4
30	18 12 53.06	0.684	23 1 31.4	0.12	17 38.3	30	18 15 0.46	0.351	23 2 14.2	0.28	15 38.3
31	18 13 9.10	0.653	23 1 28.6	0.11	17 34.6	31	18 14 51.65	0.384	23 2 21.0	0.30	15 34.2
32	18 13 24.38	+0.621	−23 1 25.9	+0.11	17 30.9	32	18 14 42.04	−0.417	−23 2 28.1	−0.31	15 30.1

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	17.″0	17.″5	18.″1	18.″6	Polar Semidiameter	18.″7	19.″3	19.″9	20.″5
Horizontal Parallax	1.6	1.7	1.7	1.8	Horizontal Parallax	1.8	1.8	1.9	1.9

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 14 51.65	−0.384	−23 2 21.0	−0.30	15 34.2
2	18 14 42.04	0.417	23 2 28.1	0.31	15 30.1
3	18 14 31.64	0.450	23 2 35.6	0.32	15 26.0
4	18 14 20.45	0.483	23 2 43.3	0.33	15 21.9
5	18 14 8.48	0.515	23 2 51.4	0.34	15 17.7
6	18 13 55.74	0.547	23 2 59.7	0.35	15 13.5
7	18 13 42.22	0.579	23 3 8.3	0.36	15 9.4
8	18 13 27.94	0.611	23 3 17.2	0.37	15 5.2
9	18 13 12.90	0.642	23 3 26.3	0.38	15 1.0
10	18 12 57.11	0.673	23 3 35.6	0.39	14 56.8
11	18 12 40.59	0.704	23 3 45.0	0.40	14 52.6
12	18 12 23.34	0.734	23 3 54.6	0.41	14 48.4
13	18 12 5.36	0.763	23 4 4.5	0.42	14 44.2
14	18 11 46.66	0.792	23 4 14.6	0.43	14 39.9
15	18 11 27.27	0.821	23 4 25.0	0.43	14 35.6
16	18 11 7.20	0.850	23 4 35.4	0.44	14 31.3
17	18 10 46.45	0.878	23 4 45.9	0.44	14 27.0
18	18 10 25.03	0.906	23 4 56.4	0.44	14 22.7
19	18 10 2.97	0.932	23 5 7.0	0.44	14 18.4
20	18 9 40.28	0.958	23 5 17.6	0.44	14 14.1
21	18 9 16.97	0.984	23 5 28.3	0.44	14 9.8
22	18 8 53.06	1.009	23 5 38.9	0.44	14 5.5
23	18 8 28.56	1.033	23 5 49.5	0.44	14 1.2
24	18 8 3.49	1.056	23 6 0.1	0.44	14 56.8
25	18 7 37.86	1.079	23 6 10.6	0.44	14 52.4
26	18 7 11.70	1.102	23 6 21.0	0.43	13 48.0
27	18 6 45.01	1.124	23 6 31.3	0.43	13 43.7
28	18 6 17.81	1.145	23 6 41.5	0.42	13 39.3
29	18 5 50.11	1.165	23 6 51.7	0.42	13 34.9
30	18 5 21.94	1.184	23 7 1.8	0.41	13 30.5
31	18 4 53.31	1.202	23 7 11.6	0.40	13 26.1
32	18 4 24.24	−1.220	−23 7 21.2	−0.40	13 21.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	20″.5	21″.0	21″.5	21″.9
Horizontal Parallax	1.9	2.0	2.0	2.1

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 4 24.24	−1.220	−23 7 21.2	−0.40	13 21.7
2	18 3 54.75	1.237	23 7 30.6	0.39	13 17.3
3	18 3 24.86	1.254	23 7 39.8	0.38	13 12.8
4	18 2 54.58	1.270	23 7 48.8	0.37	13 8.4
5	18 2 23.91	1.285	23 7 57.5	0.36	13 4.0
6	18 1 52.92	1.299	23 8 6.0	0.35	12 59.5
7	18 1 21.61	1.312	23 8 14.3	0.33	12 55.0
8	18 0 50.00	1.324	23 8 22.2	0.32	12 50.6
9	18 0 18.10	1.335	23 8 29.8	0.30	12 46.1
10	17 59 45.94	1.345	23 8 37.0	0.29	12 41.6
11	17 59 13.56	1.354	23 8 43.9	0.28	12 37.1
12	17 58 40.96	1.362	23 8 50.4	0.26	12 32.7
13	17 58 8.18	1.369	23 8 56.7	0.25	12 28.2
14	17 57 35.26	1.375	23 9 2.7	0.23	12 23.7
15	17 57 2.20	1.380	23 9 8.4	0.22	12 19.2
16	17 56 29.03	1.384	23 9 13.6	0.21	12 14.8
17	17 55 55.78	1.387	23 9 18.5	0.19	12 10.3
18	17 55 22.47	1.389	23 9 23.1	0.18	12 5.8
19	17 54 49.11	1.390	23 9 27.4	0.16	12 1.3
20	17 54 15.73	1.391	23 9 31.2	0.15	11 56.8
21	17 53 42.35	1.390	23 9 34.6	0.14	11 52.3
22	17 53 9.02	1.388	23 9 37.6	0.12	11 47.8
23	17 52 35.77	1.385	23 9 40.2	0.11	11 43.3
24	17 52 2.59	1.381	23 9 42.4	0.09	11 38.8
25	17 51 29.50	1.376	23 9 44.4	0.08	11 34.3
26	17 50 56.52	1.370	23 9 46.1	0.07	11 29.8
27	17 50 23.66	1.364	23 9 47.3	0.05	11 25.4
28	17 49 50.98	1.357	23 9 48.3	0.03	11 21.0
29	17 49 18.50	1.349	23 9 49.0	−0.01	11 16.5
30	17 48 46.23	1.340	23 9 49.3	0.00	11 12.0
31	17 48 14.18	1.330	23 9 49.2	+0.01	11 7.6
32	17 47 42.37	−1.319	−23 9 48.9	+0.02	11 3.1

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	21″.9	22″.1	22″.2	22″.1
Horizontal Parallax	2.1	2.1	2.1	2.1

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	17 48 14.18	−1.330	−23 9 49.2	+0.01	11 7.6	1	17 35 24.14	−0.635	−23 9 4.8	−0.02	8 53.0
2	17 47 42.37	1.319	23 9 48.9	0.02	11 3.1	2	17 35 9.27	0.604	23 9 5.4	0.04	8 48.9
3	17 47 10.85	1.307	23 9 48.4	0.03	10 58.6	3	17 34 55.16	0.572	23 9 6.5	0.05	8 44.7
4	17 46 39.63	1.294	23 9 47.7	0.04	10 54.2	4	17 34 41.81	0.540	23 9 7.9	0.07	8 40.5
5	17 46 8.73	1.280	23 9 46.7	0.05	10 49.8	5	17 34 29.22	0.508	23 9 9.7	0.08	8 36.4
6	17 45 38.16	1.265	23 9 45.5	0.06	10 45.3	6	17 34 17.41	0.476	23 9 11.9	0.10	8 32.3
7	17 45 7.96	1.250	23 9 44.2	0.06	10 40.9	7	17 34 6.38	0.443	23 9 14.5	0.12	8 28.2
8	17 44 38.14	1.234	23 9 42.6	0.07	10 36.5	8	17 33 56.14	0.410	23 9 17.6	0.13	8 24.1
9	17 44 8.72	1.217	23 9 40.8	0.07	10 32.1	9	17 33 46.70	0.377	23 9 21.1	0.15	8 20.0
10	17 43 39.72	1.199	23 9 38.9	0.08	10 27.7	10	17 33 38.06	0.344	23 9 25.0	0.17	8 15.9
11	17 43 11.17	1.180	23 9 36.9	0.08	10 23.3	11	17 33 30.23	0.310	23 9 29.3	0.19	8 11.8
12	17 42 43.10	1.160	23 9 34.8	0.09	10 18.9	12	17 33 23.19	0.276	23 9 34.1	0.21	8 7.8
13	17 42 15.52	1.139	23 9 32.7	0.09	10 14.5	13	17 33 16.97	0.242	23 9 39.4	0.23	8 3.8
14	17 41 48.43	1.118	23 9 30.5	0.09	10 10.1	14	17 33 11.55	0.208	23 9 45.1	0.25	7 59.8
15	17 41 21.87	1.096	23 9 28.3	0.09	10 5.7	15	17 33 6.95	0.174	23 9 51.3	0.27	7 55.8
16	17 40 55.84	1.073	23 9 26.0	0.09	10 1.3	16	17 33 3.17	0.140	23 9 58.0	0.29	7 51.8
17	17 40 30.37	1.050	23 9 23.7	0.09	9 57.0	17	17 33 0.21	0.106	23 10 5.3	0.31	7 47.8
18	17 40 5.46	1.026	23 9 21.5	0.09	9 52.6	18	17 32 58.06	0.072	23 10 13.0	0.33	7 43.8
19	17 39 41.15	1.001	23 9 19.3	0.09	9 48.3	19	17 32 56.74	0.038	23 10 21.1	0.35	7 39.8
20	17 39 17.44	0.976	23 9 17.1	0.09	9 44.0	20	17 32 56.23	−0.004	23 10 29.7	0.37	7 35.9
21	17 38 54.35	0.950	23 9 15.0	0.08	9 39.7	21	17 32 56.54	+0.030	23 10 38.8	0.39	7 32.0
22	17 38 31.87	0.923	23 9 13.1	0.08	9 35.4	22	17 32 57.67	0.064	23 10 48.4	0.41	7 28.1
23	17 38 10.03	0.896	23 9 11.3	0.07	9 31.1	23	17 32 59.60	0.098	23 10 58.5	0.43	7 24.2
24	17 37 48.86	0.869	23 9 9.8	0.07	9 26.8	24	17 33 2.35	0.132	23 11 9.1	0.45	7 20.3
25	17 37 28.35	0.841	23 9 8.4	0.06	9 22.6	25	17 33 5.91	0.166	23 11 20.2	0.47	7 16.4
26	17 37 8.51	0.813	23 9 7.1	0.05	9 18.3	26	17 33 10.28	0.199	23 11 31.7	0.49	7 12.6
27	17 36 49.34	0.784	23 9 6.1	0.04	9 14.0	27	17 33 15.45	0.233	23 11 43.7	0.51	7 8.7
28	17 36 30.87	0.755	23 9 5.2	0.03	9 9.8	28	17 33 21.43	0.267	23 11 56.1	0.53	7 4.9
29	17 36 14.11	0.726	23 9 4.7	+0.01	9 5.6	29	17 33 28.22	0.300	23 12 9.0	0.55	7 1.1
30	17 35 56.06	0.696	23 9 4.5	0.00	9 1.4	30	17 33 35 81	0.333	23 12 22.4	0.57	6 57.3
31	17 35 39.74	0.666	23 9 4.5	−0.01	8 57.2	31	17 33 44.20	0.366	23 12 36.2	0.58	6 53.5
32	17 35 24.14	−0.635	−23 9 4.8	−0.02	8 53.0	32	17 33 53.39	+0.399	−23 12 50.4	−0.60	6 49.7

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	22″.1	21″.9	21″.5	21″.1	Polar Semidiameter	21″.0	20″.5	19″.9	19″.3
Horizontal Parallax	2.1	2.1	2.0	2.0	Horizontal Parallax	2.0	1.9	1.9	1.8

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 33 53.39	+0.399	−23 12 50.4	−0.60	6 49.7
2	17 34 3.37	0.433	23 13 5.1	0.61	6 46.0
3	17 34 14.16	0.466	23 13 20.1	0.63	6 42.3
4	17 34 25.74	0.499	23 13 35.5	0.64	6 38.5
5	17 34 38.11	0.532	23 13 51.4	0.66	6 34.8
6	17 34 51.27	0.565	23 14 7.6	0.68	6 31.1
7	17 35 5.21	0.597	23 14 24.2	0.69	6 27.4
8	17 35 19.92	0.629	23 14 41.1	0.71	6 23.7
9	17 35 35.40	0.661	23 14 57.4	0.72	6 20.0
10	17 35 51.66	0.693	23 15 15.9	0.74	6 16.3
11	17 36 8.68	0.725	23 15 33.7	0.75	6 12.7
12	17 36 26.46	0.756	23 15 51.7	0.76	6 9.1
13	17 36 44.99	0.787	23 16 10.0	0.77	6 5.5
14	17 37 4.27	0.818	23 16 28.5	0.78	6 1.9
15	17 37 24.28	0.849	23 16 47.3	0.79	5 58.3
16	17 37 45.02	0.880	23 17 6.2	0.79	5 54.7
17	17 38 6.50	0.910	23 17 25.2	0.80	5 51.1
18	17 38 28.70	0.940	23 17 44.4	0.80	5 47.5
19	17 38 51.61	0.970	23 18 3.7	0.80	5 44.0
20	17 39 15.23	0.999	23 18 23.1	0.81	5 40.4
21	17 39 39.55	1.028	23 18 42.5	0.81	5 36.9
22	17 40 4.56	1.057	23 19 2.0	0.81	5 33.4
23	17 40 30.25	1.085	23 19 21.5	0.81	5 29.9
24	17 40 56.62	1.113	23 19 41.0	0.81	5 26.4
25	17 41 23.67	1.141	23 20 0.5	0.81	5 22.9
26	17 41 51.40	1.169	23 20 20.0	0.81	5 19.4
27	17 42 19.79	1.196	23 20 39.5	0.80	5 16.0
28	17 42 48.83	1.223	23 21 58.9	0.80	5 12.5
29	17 43 18.52	1.250	23 21 18.1	0.80	5 9.1
30	17 43 48.86	1.277	23 21 37.2	0.79	5 5.7
31	17 44 19.85	1.304	23 21 56.1	0.79	5 2.3
32	17 44 51.46	+1.330	−23 22 14.9	−0.78	4 58.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	19″.3	18″.7	18″.2	17″.6
Horizontal Parallax	1.8	1.8	1.7	1.7

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 44 19.85	+1.304	−23 21 56.1	−0.79	5 2.3
2	17 44 51.46	1.330	23 22 14.9	0.78	4 58.9
3	17 45 23.71	1.356	23 22 33.4	0.77	4 55.5
4	17 45 56.58	1.382	23 22 51.7	0.76	4 52.1
5	17 46 30.07	1.408	23 23 9.6	0.75	4 48.8
6	17 47 4.16	1.433	23 23 27.3	0.73	4 45.4
7	17 47 38.85	1.458	23 23 44.6	0.72	4 42.0
8	17 48 14.14	1.483	23 24 1.6	0.70	4 38.7
9	17 48 50.02	1.507	23 24 18.2	0.69	4 35.4
10	17 49 26.48	1.531	23 24 34.4	0.67	4 32.1
11	17 50 3.51	1.555	23 24 50.2	0.65	4 28.8
12	17 50 41.11	1.578	23 25 5.6	0.63	4 25.5
13	17 51 19.27	1.601	23 25 20.4	0.61	4 22.1
14	17 51 57.97	1.624	23 25 34.7	0.59	4 18.9
15	17 52 37.22	1.646	23 25 48.4	0.57	4 15.6
16	17 53 17.00	1.668	23 26 1.5	0.54	4 12.3
17	17 53 57.30	1.690	23 26 14.2	0.52	4 9.0
18	17 54 38.12	1.711	23 26 26.2	0.49	4 5.7
19	17 55 19.45	1.732	23 26 37.6	0.46	4 2.4
20	17 56 1.28	1.753	23 26 48.3	0.43	3 59.2
21	17 56 43.61	1.774	23 26 58.4	0.40	3 56.0
22	17 57 26.42	1.794	23 27 7.7	0.37	3 52.8
23	17 58 9.72	1.814	23 27 16.3	0.34	3 49.6
24	17 58 53.50	1.834	23 27 24.0	0.31	3 46.4
25	17 59 37.74	1.853	23 27 31.0	0.28	3 43.2
26	18 0 22.45	1.872	23 27 37.1	0.24	3 40.0
27	18 1 7.61	1.891	23 27 42.5	0.21	3 36.8
28	18 1 53.21	1.910	23 27 47.1	0.17	3 33.6
29	18 2 39.27	1.928	23 27 50.8	0.14	3 30.5
30	18 3 25.77	1.946	23 27 53.6	0.10	3 27.3
31	18 4 12.70	1.964	23 27 55.4	0.06	3 24.1
32	18 5 0.04	+1.981	−23 27 56.3	−0.02	3 21.0

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	17″.6	17″.2	16″.7	16″.3
Horizontal Parallax	1.7	1.6	1.6	1.5

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	18 5 0.04	+1.981	−23 27 56.3	−0.02	3 21.0
2	18 5 47.81	1.998	23 27 56.2	+0.03	3 17.9
3	18 6 35.99	2.015	23 27 55.2	0.07	3 14.7
4	18 7 24.57	2.032	23 27 53.1	0.11	3 11.6
5	18 8 13.56	2.049	23 27 49.9	0.16	3 8.5
6	18 9 2.94	2.065	23 27 45.6	0.20	3 5.4
7	18 9 52.70	2.081	23 27 40.3	0.25	2 2.3
8	18 10 42.83	2.096	23 27 33.8	0.30	2 59.2
9	18 11 33.32	2.111	23 27 26.2	0.34	2 56.1
10	18 12 24.17	2.126	23 27 17.4	0.39	2 53.0
11	18 13 15.37	2.140	23 27 7.5	0.44	2 49.9
12	18 14 6.92	2.154	23 26 56.5	0.49	2 46.8
13	18 14 58.80	2.168	23 26 44.2	0.54	2 43.7
14	18 15 51.01	2.182	23 26 30.8	0.59	2 40.7
15	18 16 43.54	2.195	23 26 16.1	0.64	2 37.6
16	18 17 36.37	2.208	23 26 0.2	0.69	2 34.6
17	18 18 29.51	2.221	23 25 43.0	0.74	2 31.5
18	18 19 22.96	2.233	23 25 24.6	0.80	2 28.5
19	18 20 16.70	2.245	23 25 4.8	0.85	2 25.5
20	18 21 10.73	2.257	23 24 43.7	0.91	2 22.4
21	18 22 5.04	2.268	23 24 21.3	0.96	2 19.4
22	18 22 59.62	2.279	23 23 57.6	1.01	2 16.4
23	18 23 54.47	2.290	23 23 32.6	1.07	2 13.4
24	18 24 49.58	2.301	23 23 6.2	1.13	2 10.3
25	18 25 44.95	2.312	23 22 38.4	1.19	2 7.3
26	18 26 40.57	2.322	23 22 9.3	1.25	2 4.3
27	18 27 36.44	2.332	23 21 38.8	1.31	2 1.3
28	18 28 32.54	2.342	23 21 6.8	1.37	1 58.3
29	18 29 28.87	2.352	23 20 33.4	1.43	1 55.3
30	18 30 25.44	2.361	23 19 58.5	1.49	1 52.3
31	18 31 22.22	2.370	23 19 22.2	1.55	1 49.3
32	18 32 19.22	+2.379	−23 18 44.3	+1.61	1 46.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	16.″3	16.″0	15.″8	15.″6
Horizontal Parallax	1.5	1.5	1.5	1.5

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	18 31 22.22	+2.370	−23 19 22.2	+1.55	1 49.3
2	18 32 19.22	2.379	23 18 44.3	1.61	1 46.3
3	18 33 16.41	2.387	23 18 5.0	1.67	1 43.4
4	18 34 13.81	2.395	23 17 24.4	1.73	1 40.4
5	18 35 11.40	2.403	23 16 42.2	1.79	1 37.4
6	18 36 9.17	2.411	23 15 58.5	1.85	1 34.4
7	18 37 7.13	2.418	23 15 13.3	1.91	1 31.5
8	18 38 5.25	2.425	23 14 26.7	1.97	1 28.5
9	18 39 3.52	2.432	23 13 38.7	2.03	1 25.5
10	18 40 1.96	2.438	23 12 49.2	2.10	1 22.6
11	18 41 0.54	2.444	23 11 58.0	2.16	1 19.6
12	18 41 59.26	2.450	23 11 5.3	2.22	1 16.7
13	18 42 58.12	2.455	23 10 11.1	2.28	1 13.7
14	18 43 57.10	2.460	23 9 15.5	2.34	1 10.8
15	18 44 56.21	2.465	23 8 18.4	2.41	1 7.8
16	18 45 55.43	2.470	23 7 19.7	2.47	1 4.9
17	18 46 54.76	2.474	23 6 19.5	2.54	1 1.9
18	18 47 54.19	2.478	23 5 17.8	2.61	0 59.0
19	18 48 53.71	2.482	23 4 14.6	2.67	0 56.0
20	18 49 53.32	2.486	23 3 9.9	2.73	0 53.1
21	18 50 53.02	2.489	23 2 3.7	2.79	0 50.1
22	18 51 52.80	2.492	23 0 56.1	2.86	0 47.2
23	18 52 52.66	2.495	22 59 46.9	2.92	0 44.2
24	18 53 52.59	2.498	22 58 36.3	2.98	0 41.3
25	18 54 52.58	2.501	22 57 24.2	3.04	0 38.3
26	18 55 52.62	2.503	22 56 10.5	3.10	0 35.4
27	18 56 52.72	2.505	22 54 55.3	3.16	0 32.5
28	18 57 52.86	2.507	22 53 38.7	3.23	0 29.6
29	18 58 53.04	2.508	22 52 20.7	3.29	0 26.6
30	18 59 53.25	2.509	22 51 1.1	3.35	0 23.7
31	19 0 53.48	2.510	22 49 39.9	3.41	0 20.7
32	19 1 53.74	+2.511	−22 48 17.3	+3.47	0 17.8

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	15.″6	15.″4	15.″3	15.″3
Horizontal Parallax	1.5	1.5	1.4	1.4

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

SATURN, 1877.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 26 40.13	+0.840	−11 34 29.7	+5.06	3 41.1
2	22 27 0.43	0.851	11 32 27.5	5.12	3 37.5
3	22 27 20.99	0.862	11 30 23.8	5.19	3 33.9
4	22 27 41.79	0.872	11 28 18.6	5.25	3 30.4
5	22 28 2.84	0.882	11 26 12.0	5.30	3 26.8
6	22 28 24.13	0.892	11 24 4.0	5.36	3 23.2
7	22 28 45.65	0.901	11 21 54.7	5.41	3 19.6
8	22 29 7.39	0.911	11 19 44.1	5.47	3 16.1
9	22 29 29.36	0.920	11 17 32.2	5.52	3 12.5
10	22 29 51.56	0.930	11 15 19.1	5.57	3 8.9
11	22 30 13.98	0.939	11 13 4.7	5.63	3 5.4
12	22 30 36.61	0.948	11 10 49.1	5.68	3 1.8
13	22 30 59.46	0.956	11 8 32.2	5.73	2 58.3
14	22 31 22.51	0.964	11 6 14.0	5.78	2 54.7
15	22 31 45.75	0.973	11 3 54.6	5.83	2 51.2
16	22 32 9.19	0.981	11 1 34.1	5.88	2 47.6
17	22 32 32.82	0.989	10 59 12.6	5.92	2 44.1
18	22 32 56.64	0.996	10 56 50.0	5.96	2 40.6
19	22 33 20.64	1.004	10 54 26.3	6.01	2 37.0
20	22 33 44.81	1.011	10 52 1.6	6.05	2 33.5
21	22 34 9.15	1.018	10 49 35.9	6.09	2 30.0
22	22 34 33.66	1.025	10 47 9.3	6.13	2 26.4
23	22 34 58.33	1.031	10 44 41.7	6.17	2 22.9
24	22 35 23.16	1.038	10 42 13.1	6.21	2 19.4
25	22 35 48.15	1.044	10 39 43.6	6.25	2 15.9
26	22 36 13.28	1.050	10 37 13.3	6.28	2 12.4
27	22 36 38.55	1.056	10 34 42.2	6.31	2 8.8
28	22 37 3.96	1.061	10 32 10.3	6.35	2 5.3
29	22 37 29.50	1.067	10 29 37.5	6.38	2 1.8
30	22 37 55.18	1.072	10 27 4.0	6.41	1 58.3
31	22 38 20.99	1.078	10 24 29.6	6.44	1 54.8
32	22 38 46.92	+1.083	−10 21 54.8	+6.47	1 51.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	7″.6	7″.5	7″.4	7″.4
Horizontal Parallax	0.9	0.8	0.8	0.8

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 38 46.92	+1.083	−10 21 54.8	+6.47	1 51.3
2	22 39 12.96	1.087	10 19 19.1	6.50	1 47.8
3	22 39 39.11	1.092	10 16 42.6	6.53	1 44.3
4	22 40 5.37	1.096	10 14 5.4	6.56	1 40.8
5	22 40 31.74	1.101	10 11 27.6	6.59	1 37.3
6	22 40 58.21	1.105	10 8 49.3	6.61	1 33.8
7	22 41 24.78	1.109	10 6 10.4	6.63	1 30.3
8	22 41 51.45	1.113	10 3 31.0	6.65	1 26.8
9	22 42 18.21	1.117	10 0 51.0	6.68	1 23.4
10	22 42 45.05	1.120	9 58 10.5	6.70	1 19.9
11	22 43 11.96	1.123	9 55 29.5	6.72	1 16.4
12	22 43 38.95	1.126	9 52 48.1	6.74	1 12.9
13	22 44 6.02	1.129	9 50 6.2	6.75	1 9.4
14	22 44 33.16	1.132	9 47 23.9	6.77	1 5.9
15	22 45 0.35	1.134	9 44 41.2	6.79	1 2.5
16	22 45 27.59	1.136	9 41 58.2	6.80	0 59.0
17	22 45 54.88	1.138	9 39 15.0	6.81	0 55.5
18	22 46 22.22	1.140	9 36 31.5	6.82	0 52.0
19	22 46 49.60	1.141	9 33 47.8	6.83	0 48.6
20	22 47 17.01	1.143	9 31 3.8	6.84	0 45.1
21	22 47 44.45	1.145	9 28 19.6	6.84	0 41.6
22	22 48 11.93	1.146	9 25 35.3	6.85	0 38.1
23	22 48 39.44	1.147	9 22 50.9	6.85	0 34.7
24	22 49 6.97	1.148	9 20 6.3	6.86	0 31.2
25	22 49 34.52	1.148	9 17 21.6	6.86	0 27.7
26	22 50 2.08	1.148	9 14 36.9	6.86	0 24.2
27	22 50 29.64	1.148	9 11 52.2	6.86	0 20.8
28	22 50 57.20	1.148	9 9 7.4	6.87	0 17.3
29	22 51 24.75	1.148	9 6 22.6	6.87	0 13.8
30	22 51 52.30	1.148	9 3 37.8	6.86	0 10.3
31	22 52 19.85	1.148	9 0 53.1	6.86	0 6.9
32	22 52 47.39	+1.147	− 8 58 8.5	+6.86	0 3.4 23 59.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	7″.4	7″.3	7″.3	7″.3
Horizontal Parallax	0.8	0.8	0.8	0.8

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	22 51 24.75	+1.149	−9 6 22.6	+6.87	0 13.8
2	22 51 52.30	1.148	9 3 37.8	6.86	0 10.3
3	22 52 19.85	1.148	9 0 53.1	6.86	0 6.9
4	22 52 47.39	1.147	8 58 8.5	6.86	0 3.4 23 59.9
5	22 53 14.93	1.147	8 55 24.0	6.85	23 56.4
6	22 53 42.45	1.146	8 52 39.6	6.85	23 52.9
7	22 54 9.94	1.145	8 49 55.4	6.84	23 49.5
8	22 54 37.40	1.144	8 47 11.4	6.83	23 46.0
9	22 55 4.83	1.142	8 44 27.5	6.82	23 42.5
10	22 55 32.22	1.140	8 41 43.8	6.82	23 39.0
11	22 55 59.56	1.138	8 39 0.3	6.81	23 35.6
12	22 56 26.86	1.136	8 36 17.1	6.79	23 32.1
13	22 56 54.11	1.135	8 33 34.3	6.77	23 28.6
14	22 57 21.32	1.133	8 30 52.0	6.75	23 25.1
15	22 57 48.47	1.130	8 28 10.1	6.74	23 21.6
16	22 58 15.56	1.127	8 25 28.6	6.72	23 18.2
17	22 58 42.58	1.124	8 22 47.6	6.70	23 14.7
18	22 59 9.53	1.121	8 20 7.0	6.68	23 11.2
19	22 59 36.40	1.118	8 17 26.9	6.66	23 7.7
20	23 0 3.19	1.115	8 14 47.2	6.64	23 4.2
21	23 0 29.90	1.111	8 12 8.0	6.62	23 0.7
22	23 0 56.52	1.107	8 9 29.4	6.59	22 57.2
23	23 1 23.04	1.103	8 6 51.5	6.57	22 53.7
24	23 1 49.47	1.099	8 4 14.2	6.54	22 50.2
25	23 2 15.81	1.095	8 1 37.6	6.51	22 46.7
26	23 2 42.05	1.091	7 59 1.7	6.48	22 43.2
27	23 3 8.18	1.086	7 56 26.5	6.45	22 39.7
28	23 3 34.20	1.082	7 53 52.0	6.42	22 36.2
29	23 4 0.10	1.077	7 51 18.2	6.39	22 32.7
30	23 4 25.89	1.072	7 48 45.2	6.36	22 29.2
31	23 4 51.56	1.067	7 46 12.9	6.33	22 25.7
32	23 5 17.11	+1.062	−7 43 41.4	+6.29	22 22.2

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	7.″3	7.″3	7.″3	7.″4
Horizontal Parallax	0.8	0.8	0.8	0.9

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 5 17.11	+1.062	−7 43 41.4	+6.29	22 22.2
2	23 5 42.54	1.057	7 41 10.8	6.26	22 18.7
3	23 6 7.83	1.051	7 38 41.1	6.22	22 15.2
4	23 6 32.98	1.045	7 36 12.4	6.18	22 11.7
5	23 6 57.99	1.039	7 33 44.6	6.14	22 8.1
6	23 7 22.85	1.033	7 31 17.7	6.10	22 4.6
7	23 7 47.57	1.027	7 28 51.8	6.06	22 1.1
8	23 8 12.15	1.021	7 26 26.9	6.02	21 57.6
9	23 8 36.58	1.015	7 24 3.0	5.98	21 54.0
10	23 9 0.85	1.008	7 21 40.1	5.93	21 50.5
11	23 9 24.95	1.001	7 19 18.3	5.89	21 47.0
12	23 9 48.89	0.994	7 16 57.6	5.84	21 43.4
13	23 10 12.66	0.987	7 14 38.1	5.79	21 39.9
14	23 10 36.25	0.979	7 12 19.8	5.74	21 36.4
15	23 10 59.65	0.971	7 10 2.7	5.69	21 32.8
16	23 11 22.87	0.963	7 7 46.8	5.63	21 29.3
17	23 11 45.90	0.956	7 5 32.2	5.58	21 25.7
18	23 12 8.75	0.948	7 3 18.8	5.53	21 22.2
19	23 12 31.41	0.940	7 1 6.7	5.48	21 18.6
20	23 12 53.87	0.932	6 58 55.9	5.42	21 15.0
21	23 13 16.13	0.923	6 56 46.5	5.36	21 11.5
22	23 13 38.18	0.915	6 54 38.5	5.31	21 7.9
23	23 14 0.02	0.906	6 52 31.8	5.25	21 4.3
24	23 14 21.65	0.897	6 50 26.5	5.19	21 0.8
25	23 14 43.07	0.888	6 48 22.7	5.13	20 57.2
26	23 15 4.27	0.879	6 46 20.3	5.07	20 53.6
27	23 15 25.25	0.869	6 44 19.4	5.01	20 50.0
28	23 15 46.00	0.860	6 42 20.0	4.94	20 46.4
29	23 16 6.53	0.851	6 40 22.1	4.88	20 42.8
30	23 16 26.83	0.841	6 38 25.7	4.82	20 39.2
31	23 16 46.90	0.831	6 36 30.9	4.75	20 35.6
32	23 17 6.73	+0.821	−6 34 37.7	+4.68	20 32.0

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	7.″4	7.″4	7.″5	7.″6
Horizontal Parallax	0.9	0.9	0.9	0.9

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

SATURN, 1877.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 16 46.90	+0.831	−6 36 30.9	+4.75	20 35.6
2	23 17 6.73	0.821	6 34 37.7	4.68	20 32.0
3	23 17 26.32	0.811	6 32 46.1	4.62	20 28.4
4	23 17 45.67	0.801	6 30 56.1	4.55	20 24.8
5	23 18 4.77	0.790	6 29 7.8	4.48	20 21.2
6	23 18 23.61	0.780	6 27 21.1	4.41	20 17.5
7	23 18 42.20	0.769	6 25 36.1	4.34	20 13.9
8	23 19 0.53	0.758	6 23 52.9	4.26	20 10.3
9	23 19 18.60	0.747	6 22 11.5	4.19	20 6.6
10	23 19 36.41	0.736	6 20 31.8	4.12	20 3.0
11	23 19 53.95	0.725	6 18 53.9	4.04	19 59.4
12	23 20 11.21	0.714	6 17 17.9	3.96	19 55.7
13	23 20 28.20	0.702	6 15 43.7	3.89	19 52.1
14	23 20 44.91	0.690	6 14 11.4	3.81	19 48.4
15	23 21 1.34	0.678	6 12 40.9	3.73	19 44.7
16	23 21 17.48	0.666	6 11 12.3	3.65	19 41.1
17	23 21 33.33	0.654	6 9 45.7	3.57	19 37.4
18	23 21 48.88	0.642	6 8 21.1	3.49	19 33.7
19	23 22 4.14	0.630	6 6 58.4	3.40	19 30.0
20	23 22 19.11	0.618	6 5 37.7	3.32	19 26.4
21	23 22 33.78	0.605	6 4 19.0	3.24	19 22.7
22	23 22 48.14	0.592	6 3 2.3	3.15	19 19.0
23	23 23 2.20	0.579	6 1 47.6	3.07	19 15.3
24	23 23 15.94	0.566	6 0 35.0	2.98	19 11.6
25	23 23 29.37	0.553	5 59 24.5	2.90	19 7.8
26	23 23 42.49	0.540	5 58 16.0	2.81	19 4.1
27	23 23 55.30	0.527	5 57 9.6	2.72	19 0.4
28	23 24 7.79	0.514	5 56 5.3	2.64	18 56.7
29	23 24 19.97	0.501	5 55 3.1	2.55	18 52.9
30	23 24 31.83	0.487	5 54 3.0	2.46	18 49.2
31	23 24 43.36	0.474	5 53 5.1	2.37	18 45.5
32	23 24 54.56	+0.460	−5 52 9.4	+2.28	18 41.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	7″.6	7″.7	7″.8	8″.0
Horizontal Parallax	0.9	0.9	0.9	0.9

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 24 54.56	+0.460	−5 52 9.4	+2.28	18 41.7
2	23 25 5.43	0.446	5 51 15.8	2.19	18 37.9
3	23 25 15.96	0.432	5 50 24.3	2.10	18 34.2
4	23 25 26.15	0.418	5 49 35.0	2.01	18 30.4
5	23 25 36.01	0.404	5 48 48.0	1.91	18 26.6
6	23 25 45.53	0.390	5 48 3.3	1.81	18 22.9
7	23 25 54.71	0.376	5 47 20.9	1.72	18 19.1
8	23 26 3.54	0.362	5 46 40.7	1.63	18 15.3
9	23 26 12.03	0.347	5 46 2.8	1.53	18 11.5
10	23 26 20.17	0.332	5 45 27.2	1.44	18 7.7
11	23 26 27.95	0.317	5 44 53.9	1.34	18 3.9
12	23 26 35.37	0.302	5 44 23.0	1.24	18 0.0
13	23 26 42.43	0.287	5 43 54.4	1.14	17 56.2
14	23 26 49.14	0.272	5 43 28.2	1.04	17 52.4
15	23 26 55.49	0.257	5 43 4.3	0.95	17 48.6
16	23 27 1.48	0.242	5 42 42.7	0.85	17 44.7
17	23 27 7.11	0.227	5 42 23.4	0.76	17 40.9
18	23 27 12.38	0.212	5 42 6.4	0.66	17 37.1
19	23 27 17.29	0.197	5 41 51.8	0.56	17 33.2
20	23 27 21.84	0.182	5 41 39.6	0.46	17 29.3
21	23 27 26.02	0.166	5 41 29.7	0.36	17 25.5
22	23 27 29.83	0.151	5 41 22.2	0.26	17 21.6
23	23 27 33.27	0.136	5 41 17.0	0.17	17 17.7
24	23 27 36.34	0.120	5 41 14.2	+0.07	17 13.8
25	23 27 39.05	0.105	5 41 13.7	−0.03	17 9.9
26	23 27 41.39	0.090	5 41 15.6	0.13	17 6.0
27	23 27 43.37	0.075	5 41 19.8	0.22	17 2.1
28	23 27 44.98	0.059	5 41 26.4	0.32	16 58.2
29	23 27 46.22	0.044	5 41 35.3	0.42	16 54.3
30	23 27 47.09	0.029	5 41 46.6	0.52	16 50.4
31	23 27 47.59	+0.013	5 42 0.2	0.62	16 46.5
32	23 27 47.72	−0.002	−5 42 16.2	−0.71	16 42.5

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	8″.0	8″.1	8″.3	8″.4
Horizontal Parallax	0.9	0.9	0.9	1.0

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 27 47.59	+0.013	−5 42 0.2	−0.62	16 46.5
2	23 27 47.72	−0.002	5 42 16.2	0.71	16 42.5
3	23 27 47.49	0.017	5 42 34.5	0.81	16 38.6
4	23 27 46.89	0.033	5 42 55.1	0.91	16 34.6
5	23 27 45.92	0.048	5 43 18.1	1.01	16 30.7
6	23 27 44.58	0.064	5 43 43.4	1.10	16 26.7
7	23 27 42.87	0.079	5 44 11.0	1.20	16 22.8
8	23 27 40.78	0.095	5 44 40.9	1.29	16 18.8
9	23 27 38.32	0.110	5 45 13.1	1.39	16 14.8
10	23 27 35.50	0.125	5 45 47.6	1.49	16 10.8
11	23 27 32.31	0.140	5 46 24.4	1.58	16 6.9
12	23 27 28.76	0.155	5 47 3.5	1.68	16 2.9
13	23 27 24.85	0.170	5 47 44.8	1.77	15 58.9
14	23 27 20.58	0.185	5 48 28.4	1.86	15 54.9
15	23 27 15.95	0.200	5 49 14.2	1.95	15 50.8
16	23 27 10.97	0.215	5 50 2.1	2.04	15 46.8
17	23 27 5.64	0.230	5 50 52.1	2.13	15 42.8
18	23 26 59.95	0.244	5 51 44.3	2.22	15 38.8
19	23 26 53.91	0.259	5 52 38.6	2.30	15 34.7
20	23 26 47.53	0.273	5 53 34.9	2.39	15 30.7
21	23 26 40.81	0.287	5 54 33.3	2.48	15 26.6
22	23 26 33.76	0.301	5 55 33.7	2.56	15 22.6
23	23 26 26.37	0.315	5 56 36.2	2.65	15 18.5
24	23 26 18.64	0.329	5 57 40.7	2.73	15 14.5
25	23 26 10.58	0.342	5 58 47.1	2.81	15 10.4
26	23 26 2.20	0.356	5 59 55.4	2.89	15 6.3
27	23 25 53.51	0.369	6 1 5.6	2.96	15 2.2
28	23 25 44.50	0.382	6 2 17.7	3.04	14 58.2
29	23 25 35.17	0.395	6 3 31.7	3.12	14 54.1
30	23 25 25.53	0.408	6 4 47.5	3.20	14 50.0
31	23 25 15.58	0.421	6 6 5.1	3.27	14 45.9
32	23 25 5.33	−0.434	−6 7 24.4	−3.34	14 41.8

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	8″.4	8″.5	8″.7	8″.8
Horizontal Parallax	1.0	1.0	1.0	1.0

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 25 5.33	−0.434	−6 7 24.4	−3.34	14 41.8
2	23 24 54.77	0.446	6 8 45.4	3.41	14 37.7
3	23 24 43.91	0.458	6 10 8.1	3.48	14 33.6
4	23 24 32.76	0.470	6 11 32.4	3.55	14 29.4
5	23 24 21.34	0.482	6 12 58.3	3.61	14 25.3
6	23 24 9.64	0.493	6 14 25.8	3.68	14 21.2
7	23 23 57.67	0.504	6 15 54.9	3.74	14 17.0
8	23 23 45.43	0.516	6 17 25.5	3.80	14 12.9
9	23 23 32.92	0.527	6 18 57.5	3.86	14 8.8
10	23 23 20.15	0.537	6 20 30.9	3.92	14 4.6
11	23 23 7.13	0.547	6 22 5.7	3.97	14 0.5
12	23 22 53.87	0.557	6 23 41.7	4.02	13 56.3
13	23 22 40.38	0.567	6 25 18.9	4.07	13 52.2
14	23 22 26.66	0.576	6 26 57.3	4.12	13 48.0
15	23 22 12.72	0.586	6 28 36.8	4.17	13 43.8
16	23 21 58.56	0.594	6 30 17.5	4.22	13 39.7
17	23 21 44.19	0.603	6 31 59.3	4.26	13 35.5
18	23 21 29.62	0.611	6 33 42.1	4.30	13 31.3
19	23 21 14.86	0.619	6 35 25.8	4.34	13 27.1
20	23 20 59.92	0.626	6 37 10.4	4.37	13 22.9
21	23 20 44.80	0.634	6 38 55.7	4.40	13 18.8
22	23 20 29.50	0.641	6 40 41.8	4.44	13 14.6
23	23 20 14.04	0.648	6 42 28.7	4.47	13 10.4
24	23 19 58.42	0.654	6 44 16.3	4.49	13 6.2
25	23 19 42.66	0.660	6 46 4.6	4.52	13 2.0
26	23 19 26.76	0.665	6 47 53.4	4.54	12 57.8
27	23 19 10.73	0.671	6 49 42.7	4.56	12 53.6
28	23 18 54.57	0.676	6 51 32.5	4.58	12 49.4
29	23 18 38.28	0.681	6 53 22.7	4.60	12 45.2
30	23 18 21.88	0.685	6 55 13.3	4.62	12 41.0
31	23 18 5.39	0.689	6 57 4.3	4.63	12 36.8
32	23 17 48.81	−0.692	−6 58 55.5	−4.64	12 32.6

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	8″.8	8″.9	9″.0	9″.0
Horizontal Parallax	1.0	1.0	1.0	1.0

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 17 48.81	−0.692	−6 58 55.5	−4.64	12 32.6
2	23 17 32.14	0.696	7 0 46.9	4.64	12 28.4
3	23 17 15.39	0.699	7 2 38.4	4.65	12 24.2
4	23 16 58.57	0.702	7 4 30.0	4.65	12 20.0
5	23 16 41.70	0.704	7 6 21.6	4.65	12 15.7
6	23 16 24.79	0.705	7 8 13.2	4.65	12 11.5
7	23 16 7.84	0.707	7 10 4.7	4.64	12 7.3
8	23 15 50.86	0.708	7 11 56.0	4.63	12 3.1
9	23 15 33.86	0.709	7 13 47.1	4.62	11 58.9
10	23 15 16.85	0.709	7 15 37.9	4.61	11 54.7
11	23 14 59.83	0.709	7 17 28.3	4.59	11 50.5
12	23 14 42.82	0.708	7 19 18.3	4.57	11 46.2
13	23 14 25.83	0.707	7 21 7.9	4.55	11 42.0
14	23 14 8.87	0.706	7 22 56.9	4.53	11 37.8
15	23 13 51.95	0.704	7 24 45.3	4.50	11 33.6
16	23 13 35.07	0.702	7 26 33.0	4.47	11 29.4
17	23 13 18.24	0.700	7 28 20.0	4.44	11 25.2
18	23 13 1.48	0.697	7 30 6.2	4.41	11 21.0
19	23 12 44.79	0.693	7 31 51.7	4.38	11 16.8
20	23 12 28.19	0.690	7 33 36.4	4.34	11 12.6
21	23 12 11.68	0.686	7 35 20.2	4.30	11 8.4
22	23 11 55.27	0.682	7 37 3.0	4.26	11 4.2
23	23 11 38.96	0.677	7 38 44.8	4.22	11 0.0
24	23 11 22.77	0.672	7 40 25.5	4.17	10 55.8
25	23 11 6.70	0.667	7 42 5.1	4.13	10 51.6
26	23 10 50.76	0.662	7 43 43.6	4.08	10 47.4
27	23 10 34.95	0.656	7 45 20.9	4.03	10 43.2
28	23 10 19.29	0.649	7 46 56.9	3.97	10 39.0
29	23 10 3.80	0.642	7 48 31.5	3.91	10 34.8
30	23 9 48.47	0.635	7 50 4.8	3.86	10 30.6
31	23 9 33.31	0.628	7 51 36.7	3.80	10 26.4
32	23 9 18.33	−0.620	−7 53 7.1	−3.74	10 22.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	9.0″	9.0″	9.0″	9.0″
Horizontal Parallax	1.0	1.0	1.0	1.0

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 9 33.31	−0.628	−7 51 36.7	−3.80	10 26.4
2	23 9 18.33	0.620	7 53 7.1	3.74	10 22.3
3	23 9 3.54	0.612	7 54 36.0	3.67	10 18.1
4	23 8 48.95	0.604	7 56 3.4	3.61	10 13.9
5	23 8 34.57	0.595	7 57 29.3	3.54	10 9.8
6	23 8 20.41	0.585	7 58 53.5	3.47	10 5.6
7	23 8 6.47	0.576	8 0 16.0	3.40	10 1.4
8	23 7 52.75	0.566	8 1 36.8	3.33	9 57.3
9	23 7 39.27	0.556	8 2 55.8	3.26	9 53.1
10	23 7 26.04	0.546	8 4 12.9	3.17	9 49.0
11	23 7 13.07	0.535	8 5 28.1	3.10	9 44.8
12	23 7 0.36	0.524	8 6 41.5	3.02	9 40.7
13	23 6 47.92	0.513	8 7 53.0	2.94	9 36.5
14	23 6 35.75	0.501	8 9 2.5	2.86	9 32.4
15	23 6 23.86	0.490	8 10 10.0	2.77	9 28.3
16	23 6 12.25	0.478	8 11 15.4	2.68	9 24.2
17	23 6 0.93	0.465	8 12 18.8	2.60	9 20.0
18	23 5 49.91	0.453	8 13 20.1	2.51	9 15.9
19	23 5 39.20	0.440	8 14 19.3	2.42	9 11.8
20	23 5 28.79	0.427	8 15 16.3	2.33	9 7.7
21	23 5 18.69	0.414	8 16 11.2	2.24	9 3.6
22	23 5 8.91	0.401	8 17 3.9	2.15	8 59.5
23	23 4 59.45	0.387	8 17 54.4	2.06	8 55.4
24	23 4 50.32	0.374	8 18 42.7	1.96	8 51.4
25	23 4 41.52	0.360	8 19 28.7	1.87	8 47.3
26	23 4 33.06	0.345	8 20 12.4	1.78	8 43.2
27	23 4 24.94	0.331	8 20 53.9	1.68	8 39.1
28	23 4 17.17	0.316	8 21 33.1	1.58	8 35.1
29	23 4 9.75	0.302	8 22 9.9	1.49	8 31.0
30	23 4 2.67	0.288	8 22 44.4	1.39	8 27.0
31	23 3 55.94	0.273	8 23 16.5	1.29	8 22.9
32	23 3 49.57	−0.258	−8 23 46.2	−1.19	8 18.9

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	9.0″	8.9″	8.8″	8.7″
Horizontal Parallax	1.0	1.0	1.0	1.0

NOTE.—North declinations are marked +, south declinations —.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 3 49.57	−0.258	−8 23 46.2	−1.19	8 18.9
2	23 3 43.57	0.242	8 24 13.5	1.09	8 14.9
3	23 3 37.95	0.226	8 24 38.4	0.99	8 10.9
4	23 3 32.70	0.211	8 25 0.8	0.88	8 6.8
5	23 3 27.83	0.195	8 25 20.7	0.78	8 2.8
6	23 3 23.34	0.179	8 25 38.1	0.67	7 58.8
7	23 3 19.23	0.163	8 25 53.0	0.57	7 54.8
8	23 3 15.50	0.147	8 26 5.5	0.47	7 50.8
9	23 3 12.15	0.131	8 26 15.5	0.36	7 46.8
10	23 3 9.19	0.115	8 26 23.0	0.26	7 42.9
11	23 3 6.62	0.099	8 26 28.0	0.16	7 38.9
12	23 3 4.44	0.083	8 26 30.5	−0.05	7 34 9
13	23 3 2.65	0.066	8 26 30.5	+0.05	7 31.0
14	23 3 1.25	0.050	8 26 28.0	0.16	7 27.0
15	23 3 0.24	0.034	8 26 23.0	0.26	7 23.1
16	23 2 59.63	0.017	8 26 15.6	0.37	7 19.1
17	23 2 59.41	−0.001	8 26 5.4	0.47	7 15.2
18	23 2 59.59	+0.016	8 25 52.8	0.57	7 11.3
19	23 3 0.16	0.032	8 25 37.8	0.68	7 7.3
20	23 3 1.13	0.049	8 25 20.3	0.78	7 3.4
21	23 3 2.50	0.065	8 25 0.4	0.88	6 59.5
22	23 3 4.26	0.081	8 24 38.0	0.99	6 55.6
23	23 3 6.41	0.098	8 24 13.1	1.09	6 51.7
24	23 3 8.96	0.114	8 23 45.7	1.19	6 47.8
25	23 3 11.90	0.131	8 23 15.8	1.30	6 44.0
26	23 3 15.24	0.147	8 22 43.5	1.40	6 40.1
27	23 3 18.97	0.164	8 22 8.8	1.50	6 36.2
28	23 3 23.09	0.180	8 21 31.6	1.60	6 32.4
29	23 3 27.60	0.196	8 20 52.0	1.70	6 28.5
30	23 3 32.50	0.212	8 20 9.9	1.80	6 24.7
31	23 3 37.80	0.229	8 19 25.4	1.91	6 20.8
32	23 3 43.49	+0.245	−8 18 38.4	+2.01	6 17.0

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	8″.6	8″.5	8″.4	8″.2
Horizontal Parallax	1.0	1.0	0.9	0.9

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Dec. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 3 37.80	+0.229	−8 19 25.4	+1.91	6 20.8
2	23 3 43.49	0.245	8 18 38.4	2.01	6 17.0
3	23 3 49.57	0.261	8 17 49.0	2.11	6 13.1
4	23 3 56.03	0.277	8 16 57.3	2.20	6 9.3
5	23 4 2.88	0.293	8 16 3.2	2.30	6 5.5
6	23 4 10.11	0.309	8 15 6.8	2.40	6 1.7
7	23 4 17.73	0.325	8 14 8.0	2.50	5 57.9
8	23 4 25.73	0.341	8 13 6.8	2.60	5 54.1
9	23 4 34.11	0.357	8 12 3.3	2.69	5 50.3
10	23 4 42.87	0.373	8 10 57.5	2.79	5 46.5
11	23 4 52.01	0.389	8 9 49.4	2.89	5 42.8
12	23 5 1.52	0.404	8 8 39.0	2.98	5 39.0
13	23 5 11.39	0.419	8 7 26.3	3.07	5 35.2
14	23 5 21.62	0.434	8 6 11.4	3.16	5 31.4
15	23 5 32.21	0.449	8 4 54.4	3.25	5 27.7
16	23 5 43.17	0.464	8 3 35.3	3.34	5 23.9
17	23 5 54.49	0.479	8 2 14.0	3.43	5 20.2
18	23 6 6.16	0.493	8 0 50.6	3.52	5 16.5
19	23 6 18.17	0.508	7 59 25.0	3.61	5 12.7
20	23 6 30.53	0.522	7 57 57.2	3.70	5 9.0
21	23 6 43.23	0.536	7 56 27.3	3.79	5 5.3
22	23 6 56.27	0.550	7 54 55.4	3.87	5 1.6
23	23 7 9.64	0.564	7 53 21.5	3.95	4 57.9
24	23 7 23.35	0.578	7 51 45.6	4.04	4 54.2
25	23 7 37.40	0.592	7 50 7.7	4.12	4 50.5
26	23 7 51.78	0.606	7 48 27.7	4.21	4 46.8
27	23 8 6.48	0.619	7 46 45.8	4.29	4 43.1
28	23 8 21.50	0.633	7 45 2.0	4.37	4 39.4
29	23 8 36.84	0.646	7 43 16.2	4.45	4 35.7
30	23 8 52.50	0.659	7 41 28.5	4.52	4 32.0
31	23 9 8.48	0.672	7 39 39.0	4.60	4 28.4
32	23 9 24.77	+0.685	−7 37 47.6	+4.68	4 24.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter	8″.2	8″.1	8″.0	7″.8
Horizontal Parallax	0.9	0.9	0.9	0.9

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

FOR GRENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	123° 48′ 12″.2	+3° 10′ 22″.1	176° 26′ 38″.4	−1° 24′ 51″.6	184° 20′ 3″.4	−2° 8′ 9″.4
1.5	131 21 27.3	2 37 27.0	183 33 39.8	2 1 46.0	191 30 22.8	2 43 29.3
2.0	138 50 35.9	2 2 3.0	190 33 47.4	2 36 14.9	198 34 38.5	3 15 47.5
2.5	146 14 44.8	1 24 55.3	197 26 58.3	3 7 53.0	205 32 29.4	3 44 40.6
3.0	153 33 12.9	0 46 47.9	204 13 18.6	3 36 20.7	212 23 44.3	4 9 51.0
3.5	160 45 31.7	+0 8 24.5	210 53 2.2	4 1 23.6	219 8 20.8	4 31 7.5
4.0	167 51 25.2	−0 29 34.1	217 26 28.8	4 22 51.6	225 46 24.7	4 48 23.4
4.5	174 50 48.4	1 6 32.2	223 54 2.8	4 40 38.6	232 18 9.2	5 1 36.9
5.0	181 43 45.3	1 41 58.8	230 16 11.7	4 54 41.7	238 43 53.7	5 10 49.5
5.5	188 30 27.9	2 15 27.2	236 33 25.2	5 5 0.6	245 4 2.5	5 16 5.6
6.0	195 11 14.1	2 46 35.0	242 46 14.1	5 11 36.5	251 19 3.8	5 17 31.5
6.5	201 46 25.8	3 15 2.7	248 55 9.3	5 14 32.2	257 29 28 8	5 15 15.1
7.0	208 16 27.1	3 40 34.9	255 0 41.9	5 13 52.4	263 35 50.6	5 9 25.5
7.5	214 41 44.2	4 3 0.0	261 3 21.7	5 9 43.4	269 38 43.7	5 0 12.5
8.0	221 2 43.8	4 22 8.6	267 3 37.3	5 2 11.8	275 38 43.1	4 47 46.5
8.5	227 19 51.7	4 37 54.0	273 1 55.5	4 51 25.0	281 36 23.6	4 32 18.3
9.0	233 33 32.4	4 50 11.7	278 58 41.9	4 37 32.0	287 32 19.6	4 13 59.2
9.5	239 44 9.3	4 58 59.1	284 54 20.3	4 20 42.3	293 27 4.4	3 53 1.3
10.0	245 52 3.8	5 4 15.4	290 49 12.5	4 1 6.7	299 21 10.2	3 29 37.1
10.5	251 57 35.4	5 6 1.4	296 43 38.6	3 38 57.0	305 15 7.1	3 3 59.7
11.0	258 1 1.4	5 4 19.9	302 37 57.1	3 14 26.3	311 9 23.7	2 36 23.3
11.5	264 2 37.5	4 59 15.0	308 32 25.2	2 47 48.9	317 4 26.3	2 7 3.0
12.0	270 2 37.7	4 50 52.2	314 27 18.9	2 19 20.1	323 0 39.2	1 36 14.9
12.5	276 1 14 7	4 39 18.9	320 22 53.2	1 49 16.5	328 58 24.1	1 4 16.4
13.0	281 58 40.3	4 24 43.9	326 19 22.5	1 17 55.8	334 58 0.8	−0 31 26.0
13.5	287 55 5.6	4 7 17.5	332 17 1.1	0 45 36.5	340 59 46.6	+0 1 56.3
14.0	293 50 41.6	3 47 11.2	338 16 2.9	−0 12 38.4	347 3 56.5	0 35 29.4
14.5	299 45 39.6	3 24 38.1	344 16 42.5	+0 20 38.2	353 10 43.4	1 8 51.4
15.0	305 40 11.9	2 59 52.1	350 19 14.9	0 53 52.3	359 20 18.3	1 41 39.5
15.5	311 34 31.9	2 33 8.3	356 23 55.9	1 26 42.3	5 32 50.5	2 13 29.9
16.0	317 28 54.2	2 4 42.9	2 31 2.4	1 58 46.4	11 48 27.8	2 43 58.6
16.5	323 23 35.6	1 34 52.6	8 40 52.4	2 29 42.4	18 7 16.0	3 12 41.4
17.0	329 18 54.9	1 3 54.8	14 53 44.9	2 59 8.0	24 29 20.9	3 39 14.9
17.5	335 15 13.1	−0 32 7.6	21 9 59.7	3 26 40.8	30 54 46.7	4 3 15.9
18.0	341 12 53.9	+0 0 10.6	27 29 57 2	3 51 58.7	37 23 37.1	4 24 22.4
18.5	347 12 23.1	0 32 40.6	33 53 58.3	4 14 39.9	43 55 55.5	4 42 13.6
19.0	253 14 9.1	1 5 3.0	40 22 23.6	4 34 22.8	50 31 44.8	4 56 30.5
19.5	359 18 42.2	1 36 57.7	46 55 32.8	4 50 46.6	57 11 7.3	5 6 56.3
20.0	5 26 34.6	2 8 4.2	53 33 44.1	5 3 31.1	63 54 5.2	5 13 16.4
20.5	11 38 19.6	2 38 1.2	60 17 13.4	5 12 17.8	70 40 39.4	5 15 19.2
21.0	17 54 30.8	3 6 26.5	67 6 13.1	5 16 49.8	77 30 50.9	5 12 56.1
21.5	24 15 42.0	3 32 57.2	74 0 51.3	5 16 52.5	84 24 39.2	5 6 2.1
22.0	30 42 26.3	3 57 10.0	81 1 10.2	5 12 14.5	91 22 1.4	4 54 36.1
22.5	37 15 13.6	4 18 40.7	88 7 5.3	5 2 48.7	98 22 53.0	4 38 41.6
23.0	43 54 30.3	4 37 4.6	95 18 24.1	4 48 32.6	105 27 6.8	4 18 26.4
23.5	50 40 38.3	4 51 57.3	102 34 45.5	4 29 30.0	112 34 31.8	3 54 3 5
24.0	57 33 52.3	5 2 54.8	109 55 38.9	4 5 51.0	119 44 53.2	3 25 51.0
24.5	64 34 18.4	5 9 34.5	117 20 24.5	3 37 53.2	126 57 51.3	2 54 12.6
25.0	71 41 52.6	5 11 36.6	124 48 14.2	3 6 1.7	134 13 1.8	2 19 37.0
25.5	78 56 18.9	5 8 44.8	132 18 13.0	2 30 48.6	141 29 55.1	1 42 37.9
26.0	86 17 9.0	5 0 48.3	139 49 19.4	1 52 52.9	148 47 56.7	1 3 53.3
26.5	93 43 41.6	4 47 43.0	147 20 28.8	1 12 58.8	156 6 27.9	+0 24 4.4
27.0	101 15 2.8	4 29 32.4	154 50 35.6	+0 31 53.9	163 24 46.1	−0 16 5.2
27.5	108 50 8.2	4 6 29.0	162 18 34.8	−0 9 32.5	170 42 6.4	0 55 52.0
28.0	116 27 44.6	3 38 54.4	169 43 25.1	0 50 31.9	177 57 42.0	1 34 32.7
28.5	124 6 33.2	3 7 18.7	177 4 10.8	1 30 18.2	185 10 46.9	2 11 26.7
29.0	131 45 12.4	2 32 19.9	184 20 3.4	2 8 9.4	192 20 36.6	2 45 57.0
29.5	139 22 22.3	1 54 42.2	191 30 22.8	2 43 29.3	199 26 30.1	3 17 31.8
30.0	146 56 47.1	1 15 13.6	198 34 38.5	3 15 47.5	206 27 50.8	3 45 44.4
30.5	154 27 18.5	+0 34 44.2	205 32 29.4	3 44 40.6	213 24 8.4	4 10 14.3
31.0	161 52 57.6	−0 5 56.8	212 23 44.3	4 9 51.0	220 14 59.6	4 30 47.2
31.5	169 12 56.3	−0 46 2.8	219 8 20.8	−4 31 7.5	227 0 8.5	−4 47 14.4

FOR GRENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	233° 39′ 26″.9	−4° 59′ 32″.2	267° 12′ 43″.5	−4° 48′ 3″.5	311° 29′ 31″.6	−2° 2′ 27″.5
1.5	240 12 54.4	5 7 41.5	273 24 30.0	4 35 48.3	317 24 8.5	1 33 14.4
2.0	246 40 37.4	5 11 47.2	279 32 15.8	4 20 28.9	323 18 12.8	1 3 2.3
2.5	253 2 49.4	5 11 56.7	285 36 26.0	4 2 20.2	329 12 22.4	0 32 7.8
3.0	259 19 49.6	5 8 19.6	291 37 29.8	3 41 37.7	335 7 16.7	−0 0 47.6
3.5	265 32 2.3	5 1 7.3	297 35 59.8	3 18 37.0	341 3 36.2	+0 30 41.1
4.0	271 39 56.2	4 50 32.1	303 32 31.7	2 53 33.5	347 2 2.1	1 2 1.0
4.5	277 44 3.1	4 36 46.8	309 27 43.2	2 26 42.6	353 3 15.6	1 32 53.7
5.0	283 44 57.7	4 20 4.7	315 22 13.6	1 58 20.0	359 7 57.0	2 3 0.3
5.5	289 43 16.8	4 0 39.6	321 16 43.3	1 28 41.0	5 16 44.6	2 32 0.7
6.0	295 39 37.8	3 38 44.9	327 11 53.1	0 58 1.5	11 30 14.5	2 59 33.8
6.5	301 34 39.4	3 14 34.5	333 8 23.3	−0 26 37.9	17 48 59.4	3 25 17.5
7.0	307 28 59.9	2 48 22.4	339 6 54.0	+0 5 12.7	24 13 26.9	3 48 48.6
7.5	313 23 17.2	2 20 23.3	345 8 3.0	0 37 12.3	30 43 58.8	4 9 43.3
8.0	319 18 8.1	1 50 51.9	351 12 26.5	1 9 2.2	37 20 50.3	4 27 37.5
8.5	325 14 7.9	1 20 4.1	357 20 37.8	1 40 21.9	44 4 8.4	4 42 7.3
9.0	331 11 50.1	0 48 16.4	3 33 6.2	2 10 49.8	50 53 50.7	4 52 50.2
9.5	337 11 45.2	−0 15 46.4	9 50 16.7	2 40 2.7	57 49 45.0	4 59 25.3
10.0	343 14 21.6	+0 17 6.3	16 12 29.4	3 7 37.0	64 51 29.5	5 1 35.8
10.5	349 20 3.8	0 50 2.2	22 39 58.0	3 33 7.9	71 58 32.3	4 59 8.8
11.0	355 29 13.2	1 22 39.1	29 12 49.5	3 56 10.2	79 10 12.7	4 51 56.6
11.5	1 42 7.0	1 54 34.4	35 51 4.2	4 16 18.6	86 25 42.3	4 39 58.7
12.0	7 58 58.1	2 25 24.2	42 34 34.4	4 33 9.0	93 44 7.4	4 23 21.1
12.5	14 19 54.9	2 54 43.5	49 23 5.0	4 46 18.8	101 4 30.9	4 2 17.5
13.0	20 45 1.6	3 22 7.2	56 16 14.0	4 55 28.4	108 25 55.2	3 37 7.7
13.5	27 14 17.6	3 47 10.2	63 13 33.2	5 0 21.2	115 47 24.3	3 8 19.1
14.0	33 47 38.1	4 9 27.9	70 14 28.9	5 0 45.7	123 8 6.0	2 36 23.4
14.5	40 24 54.4	4 28 37.3	77 18 23.8	4 56 35.1	130 27 14.0	2 1 56.8
15.0	47 5 54.2	4 44 16.8	84 24 38.6	4 47 48.4	137 44 8.5	1 25 38.2
15.5	53 50 22.8	4 56 7.5	91 32 33.8	4 34 30.8	144 58 17.7	0 48 7.9
16.0	60 38 3.1	5 3 53.8	98 41 30.9	4 16 53.0	152 9 17.2	+0 10 5.8
16.5	67 28 37.2	5 7 23.4	105 50 54.0	3 55 11.0	159 16 50.0	−0 27 49.2
17.0	74 21 46.5	5 6 28.2	113 0 11.1	3 29 46.2	166 20 45.4	1 5 0.1
17.5	81 17 12.9	5 1 4.5	120 8 54.8	3 1 4.6	173 20 58.4	1 40 52.9
18.0	88 14 38.9	4 51 13.2	127 16 42.5	2 29 35.3	180 17 28.2	2 14 56.5
18.5	95 13 48.5	4 36 59.8	134 23 16.5	1 55 50.2	187 10 17.3	2 46 43.5
19.0	102 14 27.3	4 18 34.3	141 28 23.6	1 20 23.5	193 59 30.3	3 15 49.7
19.5	109 16 22.2	3 56 11.1	148 31 54.5	0 43 50.2	200 45 13.3	3 41 54.7
20.0	116 19 21.5	3 30 9.1	155 33 42.8	+0 6 45.4	207 27 32.3	4 4 41.5
20.5	123 23 14.8	3 0 51.0	162 33 44.2	−0 30 16.1	214 6 33.3	4 23 56.6
21.0	130 27 52.2	2 28 43.3	169 31 55.7	1 6 39.7	220 42 21.6	4 39 29.9
21.5	137 33 3.6	1 54 15.7	176 28 14.7	1 41 52.6	227 15 1.6	4 51 14.6
22.0	144 38 38.5	1 18 0.7	183 22 37.7	2 15 23.8	233 44 36.6	4 59 7.2
22.5	151 44 24.8	0 40 33.3	190 15 0.1	2 46 44.9	240 11 8.8	5 3 6.6
23.0	158 50 8.6	+0 2 29.9	197 5 15.9	3 15 30.1	246 34 39.8	5 3 15.6
23.5	165 55 33.6	−0 35 31.9	203 53 17.1	3 41 16.3	252 55 10.6	4 59 39.5
24.0	173 0 20.4	1 12 55.3	210 38 53.7	4 3 44.7	259 12 42.6	4 52 25.5
24.5	180 4 7.0	1 49 3.2	217 21 54.4	4 22 39.4	265 27 17.1	4 41 43.6
25.0	187 6 28.8	2 23 21.0	224 2 6.5	4 37 48.9	271 38 57.3	4 27 45.6
25.5	194 6 58.8	2 55 16.7	230 39 16.7	4 49 5.4	277 47 47.3	4 10 45.5
26.0	201 5 8.2	3 24 21.5	237 13 12.4	4 56 25.2	283 53 53 5	3 50 58.3
26.5	208 0 28.7	3 50 10.9	243 43 42.0	4 59 48.3	289 57 24.6	3 28 40.2
27.0	214 52 31.9	4 12 25.1	250 10 35.9	4 59 18.2	295 58 32.0	3 4 8.5
27.5	221 40 51.6	4 30 49.5	256 33 47.2	4 55 2.0	301 57 30.0	2 37 40.7
28.0	228 25 4.8	4 45 14.2	262 53 12.6	4 47 9.2	307 54 35.7	2 9 35.0
28.5	235 4 52.5	4 55 34.3	269 8 52.6	4 35 51.5	313 50 9.4	1 40 9.4
29.0	241 40 0.8	5 1 49.5	275 20 52.3	4 21 22.6	319 44 34.5	1 9 42.1
29.5	248 10 21.2	5 4 3.6	281 29 21.0	4 3 57.8	325 38 17.2	0 38 31.0
30.0	254 35 51.6	5 2 23.9	287 34 32.4	3 43 52.9	331 31 46.5	−0 6 54.1
30.5	260 56 35.8	4 56 59 9	293 36 45.4	3 21 24.5	337 25 33.7	+0 24 50.9
31.0	267 12 43.5	4 48 3.5	299 36 21.4	2 56 49.2	343 20 12.9	0 56 26.2
31.5	273 24 30.0	−4 35 48.3	305 33 46.7	−2 30 24.6	349 16 19.8	+1 27 33.9

FOR GRENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	343° 20′ 13″.0	+0° 56′ 26″.2	28° 22′ 25″.2	+4° 23′ 55″.8	76° 46′ 26″.8	+5° 6′ 24″.1
1.5	349 16 19.8	1 27 33.9	34 39 55.4	4 41 19.6	83 36 42.6	4 54 21.1
2.0	355 14 32.0	1 57 56.0	41 2 41.8	4 55 30.5	90 32 59.7	4 37 51.4
2.5	1 15 27.9	2 27 14.2	47 31 13.2	5 6 10.3	97 35 18.6	4 16 58.1
3.0	7 19 46.5	2 55 9.5	54 5 55.1	5 13 0.9	104 43 32.6	3 51 49.9
3.5	13 28 6.4	3 21 22.4	60 47 8.4	5 15 45.5	111 57 26.2	3 22 41.3
4.0	19 41 5.2	3 45 32.8	67 35 8.0	5 14 9.4	119 16 34.9	2 49 53.7
4.5	25 59 18.8	4 7 19.8	74 30 1.3	5 8 0.8	126 40 24.8	2 13 55.3
5.0	32 23 19.1	4 26 22.2	81 31 47.3	4 57 11.0	134 8 12.4	1 35 21.0
5.5	38 53 34.8	4 42 17.7	88 40 15.3	4 41 36.4	141 39 5.7	0 54 52.4
6.0	45 30 28.4	4 54 44.9	95 55 3.6	4 21 19.7	149 12 5.2	+0 13 15.4
6.5	52 14 15.6	5 3 22.6	103 15 39.8	3 56 29.8	156 46 5.8	—0 28 40.3
7.0	59 5 3.5	5 7 51.5	110 41 20.6	3 27 24.3	164 19 58.8	1 10 3.4
7.5	66 2 49.6	5 7 54.0	118 11 12.7	2 54 28.2	171 52 34.4	1 50 4.5
8.0	73 7 20.9	5 3 16.6	125 44 14.5	2 18 14.7	179 22 44.5	2 27 57.3
8.5	80 18 13.2	4 53 50.7	133 19 18.1	1 39 23.8	186 49 24.9	3 2 59.8
9.0	87 34 50.9	4 39 33.7	140 55 11.9	0 58 41.5	194 11 37.9	3 34 36.4
9.5	94 56 27.8	4 20 30.1	148 30 43.2	+0 16 57.4	201 28 33.7	4 2 19.4
10.0	102 22 8.5	3 56 52.0	156 4 41.0	—0 24 57.1	208 39 32.9	4 25 48.4
10.5	109 50 50.5	3 29 0.1	163 35 58.4	1 6 11.6	215 44 6.2	4 44 50.7
11.0	117 21 26.5	2 57 22.5	171 3 35.4	1 45 58.5	222 41 55.2	4 59 20.4
11.5	124 52 47.6	2 22 34.5	178 26 40.3	2 23 34.5	229 32 51.3	5 9 17.6
12.0	132 23 45.4	1 45 16.8	185 44 30.4	2 58 22.8	236 16 56.3	5 14 47.0
12.5	139 53 15.5	1 6 14.3	192 56 33.7	3 20 52.8	242 54 19.9	5 15 57.6
13.0	147 20 19.3	+0 26 13.8	200 2 28.0	3 57 40.7	249 25 18.9	5 13 1.2
13.5	154 44 6.0	—0 13 58.0	207 2 1.1	4 21 29.6	255 50 15.8	5 6 11.2
14.0	162 3 53.3	0 53 36.2	213 55 9.6	4 41 8.7	262 9 37.8	4 55 42.6
14.5	169 19 8.3	1 31 59.0	220 41 58.0	4 56 32.3	268 23 55.3	4 41 51.3
15.0	176 29 27.4	2 8 29.4	227 22 36.9	5 7 39.4	274 33 40.6	4 24 53.7
15.5	183 34 35.8	2 42 34.7	233 57 22.2	5 14 32.9	280 39 27.8	4 5 6.3
16.0	190 34 26.2	3 13 47.6	240 26 34.0	5 17 18.4	286 41 51.5	3 42 45.7
16.5	197 28 58.0	3 41 46.2	246 50 35.2	5 16 3.9	292 41 26.4	3 18 8.6
17.0	204 18 16.0	4 6 13.5	253 9 50.4	5 10 59.3	298 38 46.4	2 51 31.7
17.5	211 2 29.6	4 26 56.8	259 24 45.6	5 2 16.1	304 34 24.4	2 23 11.9
18.0	217 41 51.0	4 43 47.4	265 35 47.1	4 50 6.7	310 28 51.9	1 53 26.4
18.5	224 16 34.4	4 56 40.4	271 43 21.1	4 34 44.4	316 22 38.8	1 22 32.6
19.0	230 46 55.3	5 5 34.4	277 47 53.4	4 16 23.5	322 16 12.8	0 50 48.1
19.5	237 13 9.9	5 10 30.5	283 49 49.2	3 55 19.0	328 9 59.6	—0 18 31.1
20.0	243 35 34.4	5 11 32.4	289 49 32.6	3 31 46.5	334 4 22.8	+0 13 59.6
20.5	249 54 24.8	5 8 45.9	295 47 26.7	3 6 2.2	339 59 43.8	0 46 24.7
21.0	256 9 56.7	5 2 18.7	301 43 53.1	2 38 22.7	345 56 21.9	1 18 24.6
21.5	262 22 24.3	4 52 20.4	307 39 12.4	2 9 5.5	351 54 34.2	1 49 39.3
22.0	268 32 1.7	4 39 2.2	313 33 44.2	1 38 28.5	357 54 35.9	2 19 48.7
22.5	274 39 2.3	4 22 36.8	319 27 47.1	1 6 50.3	3 56 40.6	2 48 32.5
23.0	280 43 39.0	4 3 18.2	325 21 38.7	0 34 29.8	10 1 0.2	3 15 30.6
23.5	286 46 4.6	3 41 21.7	331 15 36.4	—0 1 46.5	16 7 45.4	3 40 23.5
24.0	292 46 31.5	3 17 3.1	337 9 57.1	+0 31 0.1	22 17 6.0	4 2 52.2
24.5	298 45 12.9	2 50 40.0	343 4 57.5	1 3 30.3	28 29 11.1	4 22 38.5
25.0	304 42 22.3	2 22 29.9	349 0 54.6	1 35 24.2	34 44 9.2	4 39 25.6
25.5	310 38 14.1	1 52 51.2	354 58 5.7	2 6 22.1	41 2 8.9	4 52 57.8
26.0	316 33 3.9	1 22 2.6	0 56 48.6	2 36 4.5	47 23 18.8	5 3 0.9
26.5	322 27 8.7	0 50 23.0	6 57 22.2	3 4 12.2	53 47 47.9	5 9 22.4
27.0	328 20 47.1	—0 18 11.5	13 0 6.1	3 30 26.0	60 15 45.7	5 11 51.9
27.5	334 14 19.3	+0 14 12.9	19 5 20.6	3 54 28.0	66 47 22.0	5 10 21.5
28.0	340 8 7.5	0 46 31.2	25 13 27.0	4 15 59.9	73 22 46.6	5 4 45.6
28.5	346 2 35.7	1 18 24.6	31 24 47.6	4 34 43.9	80 2 9.5	4 55 1.1
29.0	351 58 9.9	1 49 34.3	37 39 45.4	4 50 24.0	86 45 40.4	4 41 8.1
29.5	357 55 18.0	2 19 41.8	43 58 43.4	5 2 44.2	93 33 28.1	4 23 10.3
30.0	3 54 29.4	2 48 28.4	50 22 4.7	5 11 29.2	100 25 39.5	4 1 14.9
30.5	9 56 15.2	3 15 35.7	56 50 11.6	5 16 25.1	107 22 19.0	3 35 33.1
31.0	16 1 7.7	3 40 45.1	63 23 25.5	5 17 19.5	114 23 27.8	3 6 21.2
31.5	22 9 40.1	+4 3 38.0	70 2 5.0	+5 14 1.9	121 29 2.8	+2 34 0.0

FOR GRENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	114° 23′ 27″.9	+3° 6′ 21″.2	167° 31′ 30″.4	−1° 36′ 24″.8	206° 6′ 47″.3	−4° 22′ 2″.6
1.5	121 29 2.8	2 34 0.0	174 43 58.7	2 11 48.4	213 4 54.6	4 38 11.3
2.0	128 38 55.1	1 58 55.3	181 57 16.0	2 45 6.3	220 1 12.0	4 50 8.0
2.5	135 52 49.5	1 21 37.7	189 10 47.4	3 15 43.4	226 55 13.3	4 57 45.5
3.0	143 10 23.7	0 42 42.8	196 23 52.7	3 43 8.1	233 46 31.5	5 1 1.3
3.5	150 31 7.5	+0 2 50.4	203 35 48.2	4 6 52.6	240 34 40.0	4 59 58.0
4.0	157 54 23.1	−0 37 16.2	210 45 47.7	4 26 34.6	247 19 13.6	4 54 42.7
4.5	165 19 25.3	1 16 52.1	217 53 4.8	4 41 58.1	253 59 50.0	4 45 26.6
5.0	172 45 22.5	1 55 11.8	224 56 54.6	4 52 53.1	260 36 10.9	4 32 24.5
5.5	180 11 17.9	2 31 31.0	231 56 35.9	4 59 16.1	267 8 2.9	4 15 54.3
6.0	187 36 11.4	3 5 8.7	238 51 32.7	5 1 9.5	273 35 17.9	3 56 15.9
6.5	194 59 1.6	3 35 28.5	245 41 16.1	4 58 41.0	279 57 53.7	3 33 50.9
7.0	202 18 49.0	4 1 59.9	252 25 24.7	4 52 3.0	286 15 54.5	3 9 1.6
7.5	209 34 37.5	4 24 19.5	259 3 45.8	4 41 31.4	292 29 29.9	2 42 10.5
8.0	216 45 37.2	4 42 11.3	265 36 15.0	4 27 24.6	298 38 55.3	2 13 40.0
8.5	223 51 6.2	4 55 26.7	272 2 56.6	4 10 2.9	304 44 31.4	1 43 52.2
9.0	230 50 31.8	5 4 3.8	278 24 2.5	3 49 47.4	310 46 43.6	1 13 7.9
9.5	237 43 31.7	5 8 7.0	284 39 51.5	3 26 59.5	316 46 1.1	0 41 47.0
10.0	244 29 53.0	5 7 45.3	290 50 48.3	3 2 1.1	322 42 57.0	−0 10 8.9
10.5	251 9 34.1	5 3 11.9	296 57 22.9	2 35 12.3	328 38 7.3	+0 21 28.2
11.0	257 42 41.3	4 54 42.7	303 0 9.2	2 6 53.4	334 32 10.1	0 52 46.8
11.5	264 9 29.7	4 42 35.1	308 59 44.5	1 37 23.6	340 25 45.5	1 23 30.1
12.0	270 30 21.3	4 27 8.3	314 56 48.7	1 7 1.2	346 19 34.8	1 53 21.4
12.5	276 45 43.6	4 8 41.3	320 52 2.9	0 36 4.1	352 14 19.9	2 22 4.6
13.0	282 56 8.3	3 47 33.5	326 46 9.2	−0 4 49.6	358 10 42.5	2 49 23.1
13.5	289 2 11.2	3 24 3.7	332 39 50.2	+0 26 25.4	4 9 23.4	3 15 0.4
14.0	295 4 30.3	2 58 30.6	338 33 47.7	0 57 23.9	10 11 2.1	3 38 39.8
14.5	301 3 44.7	2 31 12.3	344 28 42.5	1 27 49.1	16 16 16.0	4 0 4.1
15.0	307 0 34.3	2 2 26.5	350 25 13.6	1 57 23.6	22 25 39.4	4 18 55.7
15.5	312 55 39.2	1 32 30.5	356 23 57.7	2 25 49.8	28 39 42.8	4 34 57.1
16.0	318 49 38.7	1 1 41.4	2 25 28.6	2 52 49.5	34 58 52.1	4 47 50.5
16.5	324 43 10.9	−0 30 16.4	8 30 16.6	3 18 4.1	41 23 27.3	4 57 18.8
17.0	330 36 52.3	+0 1 27.1	14 38 47.8	3 41 14.4	47 53 42.2	5 3 5.7
17.5	336 31 17.0	0 33 11.5	20 51 23.7	4 2 1.2	54 29 43.8	5 4 56.7
18.0	342 26 56.6	1 4 38.7	27 8 20.6	4 20 5.5	61 11 31.0	5 2 39.7
18.5	348 24 19.9	1 35 30.1	33 29 49.1	4 35 8.2	67 58 54.5	4 56 5.8
19.0	354 23 52.4	2 5 26.4	39 55 54.1	4 46 51.6	74 51 37.3	4 45 10.4
19.5	0 25 56.3	2 34 8.1	46 26 34.5	4 54 59.5	81 49 14.5	4 29 53.8
20.0	6 30 50.1	3 1 15.2	53 1 43.2	4 59 17.6	88 51 14.4	4 10 21.9
20.5	12 38 48.1	3 26 27.7	59 41 7.6	4 59 34.8	95 56 59.7	3 46 46.7
21.0	18 50 1.9	3 49 25.7	66 24 30.3	4 55 43.2	103 5 48.9	3 19 26.7
21.5	25 4 38.1	4 9 49.5	73 11 29.9	4 47 39.5	110 16 58.1	2 48 45.7
22.0	31 22 40.3	4 27 20.5	80 1 41.8	4 35 24.4	117 29 42.7	2 15 13.1
22.5	37 44 9.0	4 41 41.3	86 54 40.0	4 19 3.5	124 43 19.4	1 39 23.0
23.0	44 9 1.6	4 52 36.1	93 49 58.3	3 58 47.5	131 57 7.5	1 1 53.0
23.5	50 37 13.2	4 59 51.4	100 47 11.1	3 34 51.7	139 10 30.5	+0 23 22.7
24.0	57 8 37.1	5 3 16.1	107 45 54.6	3 7 35.9	146 22 56.2	−0 15 27.5
24.5	63 43 5.7	5 2 41.8	114 45 47.5	2 37 23.9	153 33 57.5	0 53 57.4
25.0	70 20 31.0	4 58 3.9	121 46 32.0	2 4 42.9	160 43 13.2	1 31 28.4
25.5	77 0 45.5	4 49 21.2	128 47 53.7	1 30 3.2	167 50 26.3	2 7 23.8
26.0	83 43 42.5	4 36 35.7	135 49 41.5	0 53 57.3	174 55 24.3	2 41 10.4
26.5	90 29 16.3	4 19 53.2	142 51 46.7	+0 16 59.1	181 57 58.7	3 12 18.4
27.0	97 17 22.9	3 59 23.4	149 54 3.2	−0 20 16.7	188 58 3.5	3 40 21.6
27.5	104 8 0.1	3 35 19.8	156 56 25.9	0 57 14.7	195 55 34.6	4 4 58.0
28.0	111 1 6.0	3 7 59.3	163 58 50.3	1 33 20.1	202 50 29.2	4 25 49.5
28.5	117 56 40.3	2 37 42.5	171 1 11.8	2 7 59.0	209 42 45.0	4 42 42.1
29.0	124 54 43.1	2 4 53.7	178 3 23.4	2 40 39.0	216 32 19.3	4 55 26.0
29.5	131 55 13.3	1 30 0.1	185 5 15.9	3 10 49.6	223 19 8.8	5 3 55.4
30.0	138 58 8.6	0 53 32.3	192 6 37.8	3 38 2.9	230 3 9.8	5 8 8.3
30.5	146 3 24.4	+0 16 3.6	199 7 14.5	4 1 54.3	236 44 17.4	5 8 6.4
31.0	153 10 52.5	−0 21 50.5	206 6 47.3	4 22 2.6	243 22 26.2	5 3 55.2
31.5	160 20 20.5	−0 59 32.7	213 4 54.6	−4 38 11.3	249 57 30.3	−4 55 43.2

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

Mean Noon.	Apparent Obliquity.	Equation of Equinoxes.		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Parallax.	
1877.	23° 27′						
Jan. 0	26″.71	+ 5″.10	+0ˢ.31	0″.00	−20″.80	9″.00	343° 59′.3
10	26.77	5.67	0.35	1.38	20.79	9.00	343 27.5
20	26.89	6.13	0.37	2.75	20.77	8.99	342 55.7
30	27.04	6.44	0.39	4.13	20.74	8.98	342 24.0
Feb 9	27.20	6.59	0.40	5.50	20.71	8.96	341 52.2
19	27.34	6.59	0.40	6.88	−20.67	8.94	341 20.4
Mar. 1	27.44	6.45	0.39	8.26	20.63	8.92	340 48.7
11	27.49	6.21	0.38	9.63	20.57	8.90	340 16.9
21	27.48	5.93	0.36	11.01	20.51	8.87	339 45.1
31	27.40	5.65	0.35	12.38	20.45	8.85	339 13.3
Apr. 10	27.26	5.43	0.33	13.76	−20.39	8.82	338 41.6
20	27.07	5.30	0.32	15.14	20.34	8.80	338 9.8
30	26.86	5.30	0.32	16.51	20.29	8.78	337 38.0
May 10	26.63	5.43	0.33	17.89	20.24	8.76	337 6.2
20	26.41	5.70	0.35	19.26	20.19	8.74	336 34.5
30	26.22	6.08	0.37	20.64	−20.16	8.72	336 2.7
June 9	26.08	6.56	0.40	22.02	20.13	8.71	335 30.9
19	25.99	7.09	0.43	23.39	20.11	8.71	334 59.2
29	25.96	7.62	0.47	24.77	20.11	8.70	334 27.4
July 9	25.99	8.11	0.50	26.14	20.10	8.70	333 55.6
19	26.07	8.53	0.52	27.52	−20.12	8.71	333 23.8
29	26.18	8.84	0.54	28.90	20.14	8.72	332 52.1
Aug. 8	26.31	9.01	0.55	30.27	20.17	8.73	332 20.3
18	26.44	9.05	0.55	31.65	20.20	8.75	331 48.5
28	26.54	8.96	0.55	33.02	20.24	8.77	331 16.7
Sept. 7	26.61	8.76	0.54	34.40	−20.29	8.79	330 45.0
17	26.62	8.48	0.52	35.78	20.35	8.81	330 13.2
27	26.56	8.19	0.50	37.15	20.41	8.84	329 41.4
Oct. 7	26.44	7.91	0.48	38.53	20.47	8.87	329 9.7
17	26.27	7.71	0.47	39.90	20.53	8.88	328 37.9
27	26.05	7.62	0.47	41.28	−20.59	8.91	328 6.1
Nov. 6	25.81	7.67	0.47	42.66	20.64	8.93	327 34.4
16	25.56	7.89	0.48	44.03	20.69	8.95	327 2.6
26	25.33	8.26	0.50	45.41	20.73	8.97	326 30.8
Dec. 6	25.14	8.75	0.53	46.78	−20.76	8.98	325 59.0
16	25.01	8.32	0.57	48.16	20.78	8.99	325 27.3
26	24.95	9.93	0.61	49.54	20.79	9.00	324 55.5
36	24.96	+10.51	+0.64	50.91	−20.79	9.00	324 23.7

Mean Obliquity, 1877.0, 23° 27′ 18″.46 Motion in 100 days,—0″.1272
Precession for 1877.5, . . . 50″.2587 Log. 1.70121
Precession in a Solar Day, . 0″.1376 Log. 9.13862
Precession in a Sidereal Day, 0″.1372 Log. 9.13743
Sun's Mean Hor. Parallax, . 8″.848

Daily Motion.
−3′.177

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.	Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.
Jan. 0	9.0187	n0.9178	n0.5526	1.3026					
1	9.0347	0.9181	0.5906	1.3010	Mar. 1	9.4691	n0.9581	n1.2508	0.8058
2	9.0501	0.9184	0.6255	1.2993	2	9.4726	0.9585	1.2532	0.7820
3	9.0649	0.9187	0.6578	1.2974	3	9.4759	0.9588	1.2555	0.7567
h 4	9.0791	0.9191	0.6875	1.2954	4	9.4793	0.9592	1.2576	0.7298
(7.0) 5	9.0929	0.9195	0.7152	1.2933	h 5	9.4825	0.9595	1.2596	0.7009
6	9.1062	n0.9199	n0.7412	1.2910	(11.0) 6	9.4858	n0.9598	n1.2615	0.6699
7	9.1190	0.9204	0.7656	1.2885	7	9.4889	0.9601	1.2632	0.6363
8	9.1314	0.9209	0.7885	1.2859	8	9.4921	0.9603	1.2647	0.5998
9	9.1433	0.9214	0.8102	1.2832	9	9.4952	0.9605	1.2662	0.5598
10	9.1549	0.9220	0.8306	1.2803	10	9.4983	0.9607	1.2675	0.5157
11	9.1661	n0.9225	n0.8501	1.2772	11	9.5013	n0.9608	n1.2686	0.4664
12	9.1770	0.9231	0.8686	1.2740	12	9.5043	0.9609	1.2697	0.4106
13	9.1875	0.9238	0.8862	1.2706	13	9.5073	0.9610	1.2705	0.3465
14	9.1977	0.9244	0.9029	1.2670	14	9.5103	0.9611	1.2713	0.2712
15	9.2076	0.9251	0.9189	1.2633	15	9.5132	0.9611	1.2719	0.1799
16	9.2172	n0.9258	n0.9342	1.2594	16	9.5161	n0.9611	n1.2724	0.0642
17	9.2266	0.9265	0.9489	1.2553	17	9.5190	0.9610	1.2728	9.9057
18	9.2357	0.9272	0.9630	1.2511	18	9.5218	0.9610	1.2730	9.6538
h 19	9.2445	0.9279	0.9764	1.2467	19	9.5246	0.9609	1.2731	8.9828
(8.0) 20	9.2531	0.9287	0.9893	1.2421	20	9.5274	0.9607	1.2731	n9.4114
21	9.2615	n0.9295	n1.0017	1.2373	h 21	9.5302	n0.9606	n1.2729	n9.7863
22	9.2696	0.9303	1.0137	1.2323	(12.0) 22	9.5330	0.9604	1.2726	9.9844
23	9.2775	0.9311	1.0251	1.2271	23	9.5337	0.9601	1.2722	0.1197
24	9.2852	0.9319	1.0362	1.2217	24	9.5385	0.9599	1.2717	0.2227
25	9.2927	0.9327	1.0468	1.2161	25	9.5412	0.9596	1.2710	0.3056
26	9.3000	n0.9335	n1.0571	1.2104	26	9.5439	n0.9592	n1.2702	n0.3750
27	9.3072	0.9344	1.0669	1.2044	27	9.5466	0.9589	1.2692	0.4348
28	9.3141	0.9352	1.0764	1.1981	28	9.5493	0.9585	1.2682	0.4872
29	9.3209	0.9360	1.0856	1.1917	29	9.5520	0.9581	1.2670	0.5338
30	9.3275	0.9369	1.0944	1.1850	30	9.5547	0.9577	1.2656	0.5757
31	9.3339	0.9377	1.1030	1.1781	31	9.5574	0.9572	1.2642	0.6138
Feb. 1	9.3402	n0.9386	n1.1112	1.1709	Apr. 1	9.5601	n0.9567	n1.2626	n0.6487
2	9.3463	0.9394	1.1192	1.1635	2	9.5628	0.9561	1.2608	0.6808
h 3	9.3523	0.9403	1.1268	1.1558	3	9.5655	0.9556	1.2590	0.7106
(9.0) 4	9.3581	0.9411	1.1342	1.1478	h 4	9.5682	0.9550	1.2570	0.7384
5	9.3638	0.9420	1.1414	1.1395	(13.0) 5	9.5709	0.9544	1.2548	0.7643
6	9.3694	n0.9428	n1.1483	1.1310	6	9.5736	n0.9537	n1.2526	n0.7887
7	9.3748	0.9436	1.1549	1.1221	7	9.5762	0.9530	1.2501	0.8116
8	9.3801	0.9444	1.1613	1.1129	8	9.5789	0.9523	1.2476	0.8333
9	9.3853	0.9453	1.1675	1.1034	9	9.5816	0.9516	1.2449	0.8537
10	9.3903	0.9461	1.1735	1.0936	10	9.5843	0.9509	1.2420	0.8732
11	9.3953	n0.9469	n1.1792	1.0833	11	9.5870	n0.9501	n1.2390	n0.8917
12	9.4001	0.9476	1.1847	1.0727	12	9.5897	0.9493	1.2359	0.9092
13	9.4048	0.9484	1.1900	1.0617	13	9.5924	0.9485	1.2326	0.9260
14	9.4095	0.9491	1.1952	1.0503	14	9.5952	0.9477	1.2292	0.9420
15	9.4140	0.9499	1.2001	1.0384	15	9.5979	0.9468	1.2256	0.9573
16	9.4185	n0.9506	n1.2048	1.0261	16	9.6006	n0.9459	n1.2219	n0.9720
17	9.4228	0.9513	1.2094	1.0133	17	9.6034	0.9451	1.2180	0.9860
h 18	9.4271	0.9520	1.2138	0.9999	18	9.6061	0.9441	1.2139	0.9995
(10.0) 19	9.4313	0.9526	1.2180	0.9860	19	9.6089	0.9432	1.2097	1.0124
20	9.4354	0.9533	1.2220	0.9715	h 20	9.6117	0.9422	1.2053	1.0249
21	9.4394	n0.9539	n1.2258	0.9564	(14.0) 21	9.6144	n0.9413	n1.2007	n1.0369
22	9.4434	0.9545	1.2295	0.9406	22	9.6172	0.9403	1.1960	1.0483
23	9.4472	0.9551	1.2330	0.9241	23	9.6200	0.9393	1.1911	1.0594
24	9.4510	0.9556	1.2364	0.9067	24	9.6228	0.9383	1.1860	1.0701
25	9.4548	0.9562	1.2396	0.8886	25	9.6257	0.9373	1.1807	1.0804
26	9.4585	n0.9567	n1.2426	0.8695	26	9.6285	n0.9362	n1.1753	n1.0904
27	9.4621	0.9572	1.2455	0.8494	27	9.6313	0.9352	1.1696	1.1000
28	9.4656	0.9576	1.2482	0.8282	28	9.6342	0.9341	1.1638	1.1092
29	9.4691	0.9581	1.2508	0.8058	29	9.6370	0.9331	1.1577	1.1181
30	9.4726	n0.9585	n1.2532	0.7820	30	9.6399	n0.9320	n1.1515	n1.1268

Jan. 0 to Jan. 13, E = + 0′.01.

Jan. 14 to March 8, E = + 0′.02.

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.	Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.
May 1	9.6427	n0.9309	n1.1450	n1.1351	July 1	9.8159	n0.8897	0.5282	n1.3034
2	9.6456	0.9298	1.1383	1.1432	2	9.8184	0.8899	0.5660	1.3021
3	9.6485	0.9287	1.1314	1.1509	3	9.8208	0.8901	0.6006	1.3005
4	9.6514	0.9276	1.1242	1.1585	4	9.8232	0.8903	0.6326	1.2989
5	9.6543	0.9265	1.1168	1.1657	5	9.8257	0.8906	0.6622	1.2972
$(15^{h}.0)$ 6	9.6572	n0.9254	n1.1091	n1.1727	$(19^{h}.0)$ 6	9.8280	n0.8909	0.6898	n1.2953
7	9.6601	0.9243	1.1012	1.1795	7	9.8304	0.8912	0.7157	1.2932
8	9.6630	0.9232	1.0930	1.1861	8	9.8328	0.8915	0.7400	1.2911
9	9.6659	0.9221	1.0846	1.1924	9	9.8351	0.8918	0.7629	1.2888
10	9.6689	0.9210	1.0758	1.1985	10	9.8374	0.8922	0.7846	1.2864
11	9.6718	n0.9199	n1.0668	n1.2044	11	9.8397	n0.8927	0.8051	n1.2838
12	9.6748	0.9188	1.0574	1.2101	12	9.8419	0.8931	0.8246	1.2812
13	9.6777	0.9178	1.0477	1.2156	13	9.8442	0.8936	0.8431	1.2783
14	9.6807	0.9167	1.0377	1.2210	14	9.8464	0.8940	0.8607	1.2754
15	9.6836	0.9156	1.0273	1.2261	15	9.8486	0.8946	0.8776	1.2723
16	9.6866	n0.9145	n1.0165	n1.2310	16	9.8507	n0.8951	0.8937	n1.2690
17	9.6895	0.9135	1.0053	1.2358	17	9.8529	0.8956	0.9091	1.2656
18	9.6925	0.9124	0.9937	1.2404	18	9.8550	0.8962	0.9238	1.2621
19	9.6955	0.9114	0.9817	1.2448	19	9.8571	0.8968	0.9380	1.2584
20	9.6984	0.9104	0.9692	1.2491	20	9.8591	0.8974	0.9516	1.2545
$(16^{h}.0)$ 21	9.7014	n0.9094	n0.9562	n1.2532	$(20^{h}.0)$ 21	9.8612	n0.8980	0.9647	n1.2505
22	9.7043	0.9084	0.9427	1.2571	22	9.8632	0.8987	0.9773	1.2464
23	9.7073	0.9074	0.9287	1.2608	23	9.8652	0.8993	0,9894	1.2420
24	9.7103	0.9065	0.9140	1.2645	24	9.8672	0.9000	1.0011	1.2375
25	9.7132	0.9055	0.8988	1.2679	25	9.8691	0.9007	1.0123	1.2329
26	9.7162	n0.9046	n0.8828	n1.2712	26	9.8711	n0.9014	1.0231	n1.2280
27	9.7191	0.9037	0.8661	1.2744	27	9.8730	0.9021	1.0336	1.2230
28	9.7221	0.9029	0.8486	1.2774	28	9.8749	0.9028	1.0437	1.2178
29	9.7250	0.9020	0.8303	1.2803	29	9.8767	0.9035	1.0535	1.2124
30	9.7280	0.9012	0.8111	1.2831	30	9.8786	0.9043	1.0629	1.2068
31	9.7309	0.9004	0.7908	1.2856	31	9.8804	0.9050	1.0720	1.2011
June 1	9.7338	n0.8996	n0.7695	n1.2881	Aug. 1	9.8822	n0.9058	1.0808	n1.1951
2	9.7367	0.8988	0.7468	1.2904	2	9.8839	0.9065	1.0893	1.1889
3	9.7396	0.8981	0.7228	1.2926	3	9.8857	0.9073	1.0976	1.1825
4	9.7425	0.8974	0.6974	1.2947	4	9.8874	0.9080	1.1055	1.1759
$(17^{h}.0)$ 5	9.7454	0.8967	0.6702	1.2966	$(21^{h}.0)$ 5	9.8891	0.9088	1.1132	1.1690
6	9.7483	n0.8960	n0.6410	n1.2984	6	9.8908	n0.9095	1.1207	n1.1620
7	9.7512	0.8954	0.6097	1.3001	7	9.8925	0.9103	1.1279	1.1546
8	9.7540	0.8948	0.5757	1.3017	8	9.8941	0.9110	1.1349	1.1470
9	9.7569	0.8942	0.5388	1.3031	9	9.8957	0.9118	1.1416	1.1392
10	9.7597	0.8937	0.4983	1.3044	10	9.8973	0.9125	1.1482	1.1311
11	9.7626	n0.8932	n0.4535	n1.3055	11	9.8989	n0.9133	1.1545	n1.1227
12	9.7654	0.8927	0.4033	1.3066	12	9.9004	0.9140	1.1606	1.1140
13	9.7682	0.8923	0.3466	1.3075	13	9.9020	0.9148	1.1665	1.1050
14	9.7710	0.8918	0.2811	1.3083	14	9.9035	0.9155	1.1722	1.0957
15	9.7737	0.8915	0.2039	1.3090	15	9.9050	0.9162	1.1777	1.0861
16	9.7765	n0.8911	n0.1099	n1.3096	16	9.9064	n0.9169	1.1830	n1.0761
17	9.7792	0.8908	9.9895	1.3100	17	9.9079	0.9176	1.1882	1.0657
18	9.7820	0.8905	9.8222	1.3103	18	9.9093	0.9183	1.1931	1.0550
19	9.7847	0.8902	9.5483	1.3105	19	9.9108	0.9189	1.1979	1.0438
20	9.7874	0.8900	n8.5913	1.3106	20	9.9122	0.9196	1.2025	1.0323
$(18^{h}.0)$ 21	9.7901	n0.8898	p9.4347	n1.3105	$(22^{h}.0)$ 21	9.9135	n0.9202	1.2070	n1.0202
22	9.7927	0.8897	9.7666	1.3104	22	9.9149	0.9209	1.2112	1.0077
23	9.7954	0.8895	9.9524	1.3101	23	9.9163	0.0215	1.2154	0.9948
24	9.7980	0.8895	0.0820	1.3097	24	9.9176	0.9220	1.2193	0.9812
25	9.8006	0.8894	0.1816	1.3092	25	9.9189	0.9226	1.2231	0.9671
26	9.8032	n0.8894	0.2625	n1.3085	26	9.9202	n0.9232	1.2268	n0.9524
27	9.8058	0.8894	0.3305	1.3077	27	9.9215	0.9237	1.2303	0.9371
28	9.8083	0.8894	0.3892	1.3069	28	9.9228	0.9242	1.2336	0.9210
29	9.8109	0.8895	0.4408	1.3058	29	9.9240	0.9247	1.2368	0.9042
30	9.8134	0.8896	0.4868	1.3047	30	9.9253	0.9252	1.2399	0.8866
31	9.8159	n0.8897	0.5282	n1.3034	31	9.9265	n0.9256	1.2428	n0.8682

March 9 to May 27, E = + 0″.01.

May 28 to Dec. 31, E = + 0″.02.

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.	Solar day. Sid. hour.	Log. A.	Log. B.	Log. C.	Log. D.
Sept. 1	9.9277	n0.9260	1.2456	n0.8488	Nov. 1	9.9953	n0.8955	1.1579	1.1179
2	9.9289	0.9264	1.2482	0.8283	2	9.9966	0.8942	1.1515	1.1268
3	9.9301	0.9268	1.2507	0.8066	h 3	9.9979	0.8929	1.1447	1.1354
h 4	9.9313	0.9271	1.2530	0.7836	(3.0) 4	9.9991	0.8916	1.1378	1.1437
(23.0) 5	9.9324	0.9274	1.2553	0.7592	5	0.0004	0.8902	1.1306	1.1518
6	9.9336	n0.9277	1.2573	n0.7333	6	0.0017	n0.8889	1.1231	1.1595
7	9.9347	0.9280	1.2593	0.7055	7	0.0030	0.8876	1.1154	1.1671
8	9.9359	0.9283	1.2611	0.6757	8	0.0044	0.8862	1.1074	1.1743
9	9.9370	0.9285	1.2628	0.6435	9	0.0057	0.8849	1.0991	1.1813
10	9.9381	0.9286	1.2644	0.6086	10	0.0070	0.8836	1.0905	1.1881
11	9.9392	n0.9288	1.2658	n0.5705	11	0.0084	n0.8822	1.0815	1.1946
12	9.9403	0.9289	1.2671	0.5285	12	0.0098	0.8809	1.0723	1.2009
13	9.9414	0.9290	1.2683	0.4819	13	0.0111	0.8795	1.0627	1.2070
14	9.9425	0.9290	1.2693	0.4295	14	0.0125	0.8782	1.0527	1.2129
15	9.9436	0.9291	1.2703	0.3697	15	0.0139	0.8769	1.0424	1.2185
16	9.9446	n0.9291	1.2710	n0.3003	16	0.0153	n0.8756	1.0317	1.2240
17	9.9457	0.9290	1.2717	0.2174	17	0.0167	0.8742	1.0205	1.2292
18	9.9468	0.9290	1.2722	0.1145	18	0.0181	0.8729	1.0090	1.2343
19	9.9478	0.9289	1.2727	9.9792	h 19	0.0195	0.8717	0.9969	1.2392
h 20	9.9489	0.9287	1.2729	9.7814	(4.0) 20	0.0209	0.8704	0.9844	1.2438
(0.0) 21	9.9499	n0.9286	1.2731	n9.4075	21	0.0224	n0.8691	0.9714	1.2483
22	9.9510	0.9284	1.2731	p8.9759	22	0.0238	0.8678	0.9578	1.2527
23	9.9520	0.9281	1.2730	9.6477	23	0.0252	0.8666	0.9436	1.2568
24	9.9531	0.9278	1.2728	9.9000	24	0.0267	0.8654	0.9289	1.2608
25	9.9541	0.9275	1.2724	0.0583	25	0.0281	0.8642	0.9134	1.2646
26	9.9551	n0.9272	1.2719	0.1742	26	0.0296	n0.8630	0.8972	1.2683
27	9.9562	0.9269	1.2713	0.2655	27	0.0311	0.8619	0.8803	1.2717
28	9.9572	0.9265	1.2706	0.3408	28	0.0325	0.8608	0.8625	1.2751
29	9.9582	0.9260	1.2697	0.4048	29	0.0340	0.8597	0.8438	1.2782
30	9.9593	0.9256	1.2687	0.4606	30	0.0355	0.8586	0.8241	1.2812
Oct. 1	9.9603	n0.9251	1.2676	0.5100	Dec. 1	0.0370	n0.8575	0.8033	1.2841
2	9.9614	0.9245	1.2663	0.5542	2	0.0385	0.8565	0.7813	1.2868
h 3	9.9624	0.9240	1.2649	0.5942	3	0.0400	0.8555	0.7581	1.2893
(1.0) 4	9.9635	0.9234	1.2634	0.6308	h 4	0.0415	0.8545	0.7333	1.2917
5	9.9645	0.9227	1.2617	0.6644	(5.0) 5	0.0429	0.8536	0.7069	1.2940
6	9.9656	n0.9221	1.2599	0.6954	6	0.0444	n0.8527	0.6786	1.2961
7	9.9666	0.9214	1.2580	0.7244	7	0.0459	0.8519	0.6482	1.2980
8	9.9677	0.9207	1.2559	0.7514	8	0.0474	0.8510	0.6154	1.2998
9	9.9688	0.9199	1.2537	0.7767	9	0.0489	0.8503	0.5797	1.3015
10	9.9698	0.9191	1.2513	0.8005	10	0.0504	0.8495	0.5407	1.3030
11	9.9709	n0.9183	1.2488	0.8229	11	0.0519	n0.8488	0.4976	1.3044
12	9.9720	0.9175	1.2462	0.8442	12	0.0534	0.8481	0.4497	1.3056
13	9.9731	0.9166	1.2434	0.8643	13	0.0549	0.8475	0.3956	1.3067
14	9.9742	0.9157	1.2404	0.8834	14	0.0564	0.8469	0.3336	1.3077
15	9.9753	0.9148	1.2373	0.9016	15	0.0579	0.8463	0.2612	1.3085
16	9.9764	n0.9138	1.2340	0.9190	16	0.0594	n0.8458	0.1739	1.3092
17	9.9775	0.9128	1.2306	0.9356	17	0.0609	0.8454	0.0645	1.3098
18	9.9786	0.9118	1.2270	0.9514	18	0.0624	0.8449	9.9176	1.3102
h 19	9.9798	0.9108	1.2233	0.9666	h 19	0.0638	0.8445	9.6936	1.3104
(2.0) 20	9.9809	0.9097	1.2194	0.9811	(6.0) 20	0.0653	0.8442	p9.2055	1.3106
21	9.9821	n0.9087	1.2153	0.9951	21	0.0668	n0.8439	n9.2380	1.3106
22	9.9832	0.9076	1.2110	1.0085	22	0.0682	0.8436	9.7044	1.3104
23	9.9844	0.9064	1.2066	1.0214	23	0.0695	0.8434	9.9242	1.3102
24	9.9856	0.9053	1.2020	1.0338	24	0.0712	0.8433	0.0693	1.3097
25	9.9868	0.9041	1.1972	1.0457	25	0.0726	0.8431	0.1777	1.3092
26	9.9880	0.9029	1.1922	1.0571	26	0.0740	0.8430	0.2643	1.3085
27	9.9892	n0.9017	1.1870	1.0682	27	0.0755	n0.8430	n0.3364	1.3077
28	9.9904	0.9005	1.1816	1.0788	28	0.0769	0.8430	0.3981	1.3067
29	9.9916	0.8993	1.1760	1.0891	29	0.0783	0.8430	0.4520	1.3056
30	9.9928	0.8980	1.1702	1.0991	30	0.0797	0.8431	0.4998	1.3043
31	9.9941	0.8968	1.1642	1.1086	31	0.0811	0.8432	0.5427	1.3029
32	9.9953	n0.8955	1.1579	1.1179	32	0.0825	n0.8434	n0.5816	1.3014

May 28 to Dec. 31, E = + 0″.02.

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	τ.	*f*.	Log *g*.	G.	Log *h*.	H.	Log *i*.	*i*.	*f*.	G.	H.
	y	″		° ′		° ′		″	s	h m	h m
Jan. 0	0.0026	+ 4.82	0.9313	284 12	1.3093	349 55	*n*0.1899	−1.55	+0.322	18 56.8	23 19.7
1	.0054	5.00	0.9325	284 42	1.3091	348 59	0.2280	1.69	0.334	18 58.8	23 15.9
2	.0081	5.18	0.9338	285 12	1.3088	348 2	0.2629	1.83	0.346	19 0.8	23 12.1
h 3	.0109	5.36	0.9352	285 41	1.3086	347 5	0.2952	1.97	0.358	19 2.7	23 8.3
(7.0) 4	.0136	5.54	0.9366	286 10	1.3083	346 9	0.3249	2.11	0.370	19 4.7	23 4.6
5	.0163	5.72	0.9381	286 38	1.3079	345 12	0.3526	2.25	0.381	19 6.6	23 0.8
6	.0191	+ 5.90	0.9396	287 7	1.3076	344 15	*n*0.3786	−2.39	+0.393	19 8.4	22 57.0
7	.0218	6.07	0.9412	287 34	1.3072	343 18	0.4030	2.53	0.405	19 10.3	22 53.2
8	.0245	6.25	0.9428	288 2	1.3069	342 21	0.4259	2.67	0.417	19 12.1	22 49.4
9	.0273	6.42	0.9444	288 29	1.3064	341 24	0.4476	2.80	0.428	19 13.9	22 45.6
10	.0300	6.60	0.9461	288 55	1.3060	340 27	0.4680	2.94	0.440	19 15.7	22 41.8
11	.0328	+ 6.77	0.9478	289 22	1.3056	339 30	*n*0.4875	−3.07	+0.451	19 17.4	22 38.0
12	.0355	6.94	0.9496	289 47	1.3052	338 32	0.5060	3.21	0.463	19 19.1	22 34.1
13	.0382	7.11	0.9513	290 12	1.3047	337 35	0.5236	3.34	0.474	19 20.8	22 30.3
14	.0410	7.28	0.9532	290 37	1.3042	336 37	0.5403	3.47	0.485	19 22.5	22 26.5
15	.0437	7.45	0.9550	291 1	1.3037	335 39	0.5563	3.60	0.497	19 24.1	22 22.6
16	.0465	+ 7.61	0.9569	291 25	1.3032	334 41	*n*0.5716	−3.73	+0.508	19 25.7	22 18.7
17	.0492	7.78	0.9587	291 49	1.3027	333 43	0.5863	3.86	0.519	19 27.3	22 14.9
h 18	.0519	7.94	0.9606	292 12	1.3022	332 45	0.6004	3.98	0.530	19 28.8	22 11.0
(8.0) 19	.0547	8.11	0.9625	292 34	1.3016	331 47	0.6138	4.11	0.541	19 30.3	22 7.2
20	.0574	8.27	0.9645	292 56	1.3011	330 48	0.6267	4.23	0.551	19 31.8	22 3.2
21	.0601	+ 8.43	0.9664	293 18	1.3005	329 50	*n*0.6391	−4.36	+0.562	19 33.2	21 59.3
22	.0629	8.59	0.9684	293 39	1.2998	328 51	0.6511	4.48	0.573	19 34.6	21 55.4
23	.0656	8.75	0.9703	294 0	1.2993	327 52	0.6625	4.60	0.583	19 36.0	21 51.5
24	.0684	8.90	0.9723	294 20	1.2987	326 53	0.6736	4.72	0.593	19 37.4	21 47.6
25	.0711	9.06	0.9743	294 40	1.2981	325 54	0.6842	4.83	0.604	19 38.7	21 43.6
26	.0738	+ 9.21	0.9763	295 0	1.2975	324 55	*n*0.6945	−4.95	+0.614	19 40.0	21 39.7
27	.0766	9.36	0.9782	295 19	1.2969	323 55	0.7043	5.06	0.624	19 41.3	21 35.7
28	.0793	9.51	0.9802	295 38	1.2962	322 56	0.7138	5.17	0.634	19 42.5	21 31.7
29	.0820	9.66	0.9822	295 56	1.2956	321 56	0.7230	5.28	0.644	19 43.8	21 27.7
30	.0848	9.81	0.9841	296 14	1.2949	320 56	0.7318	5.39	0.654	19 45.0	21 23.7
31	.0875	9.96	0.9861	296 32	1.2943	319 56	0.7404	5.50	0.664	19 46.1	21 19.7
Feb. 1	.0903	+10.10	0.9880	296 49	1.2936	318 56	*n*0.7486	−5.60	+0.673	19 47.3	21 15.6
2	.0930	10.24	0.9899	297 6	1.2930	317 55	0.7566	5.71	0.683	19 48.4	21 11.7
h 3	.0957	10.39	0.9919	297 23	1.2923	316 55	0.7642	5.81	0.692	19 49.5	21 7.6
(9.0) 4	.0985	10.53	0.9938	297 39	1.2916	315 54	0.7716	5.91	0.702	19 50.6	21 3.6
5	.1012	10.67	0.9957	297 55	1.2910	314 53	0.7788	6.01	0.711	19 51.7	20 59.5
6	.1039	+10.80	0.9975	298 10	1.2903	313 51	*n*0.7857	−6.11	+0.720	19 52.7	20 55.4
7	.1067	10.94	0.9994	298 25	1.2896	312 50	0.7923	6.20	0.729	19 53.7	20 51.3
8	.1094	11.07	1.0012	298 40	1.2890	311 49	0.7987	6.29	0.738	19 54.7	20 47.2
9	.1122	11.21	1.0031	298 55	1.2883	310 47	0.8049	6.38	0.747	19 55.7	20 43.1
10	.1149	11.34	1.0049	299 9	1.2877	309 45	0.8109	6.47	0.756	19 56.6	20 39.0
11	.1176	+11.47	1.0067	299 23	1.2870	308 44	*n*0.8168	−6.56	+0.765	19 57.5	20 34.9
12	.1204	11.60	1.0084	299 37	1.2864	307 41	0.8221	6.64	0.773	19 58.5	20 30.8
13	.1231	11.72	1.0102	299 50	1.2858	306 39	0.8274	6.72	0.782	19 59.4	20 26.6
14	.1258	11.85	1.0119	300 4	1.2851	305 37	0.8326	6.80	0.790	20 0.2	20 22.5
15	.1286	11.97	1.0136	300 17	1.2845	304 34	0.8375	6.88	0.798	20 1.1	20 18.3
16	.1313	+12.10	1.0153	300 30	1.2839	203 32	*n*0.8422	−6.96	+0.806	20 2.0	20 14.1
17	.1341	12.22	1.0169	300 42	1.2833	302 29	0.8468	7.03	0.815	20 2.8	20 9.9
h 18	.1368	12.34	1.0185	300 55	1.2827	301 26	0.8512	7.10	0.823	20 3.7	20 5.7
(10.0) 19	.1395	12.46	1.0201	301 7	1.2821	300 23	0.8554	7.17	0.830	20 4.5	20 1.5
20	.1423	12.57	1.0217	301 19	1.2815	299 19	0.8594	7.23	0.838	20 5.3	19 57.3
21	.1450	+12.69	1.0233	301 31	1.2810	298 16	*n*0.8632	−7.30	+0.846	20 6.1	19 53.1
22	.1477	12.81	1.0248	301 43	1.2804	297 13	0.8669	7.36	0.854	20 6.9	19 48.8
23	.1505	12.92	1.0263	301 55	1.2799	296 9	0.8704	7.42	0.862	20 7.7	19 44.6
24	.1532	13.04	1.0277	302 6	1.2794	295 5	0.8738	7.48	0.869	20 8.4	19 40.3
25	.1560	13.15	1.0292	302 18	1.2789	294 1	0.8770	7.53	0.877	20 9.2	19 36.1
26	.1587	+13.26	1.0306	302 29	1.2784	292 57	*n*0.8800	−7.59	+0.884	20 9.9	19 31.8
27	.1614	13.37	1.0320	302 40	1.2780	291 53	0.8829	7.64	0.891	20 10.7	19 27.5
28	.1642	13.48	1.0334	302 52	1.2776	290 49	0.8856	7.68	0.899	20 11.4	19 23.3
29	0.1669	+13.59	1.0347	303 3	1.2771	289 45	*n*0.8882	−7.73	+0.906	20 12.2	19 19.0

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	τ.	*f*.	Log *g*.	G.	Log *h*.	H.	Log *i*.	*i*.	*f*.	G.	H.
	y	″		° ′		° ′		″	s	h m	h m
Mar. 1	0.1669	+13.59	1.0347	303 3	1.2771	289 45	*n*0.8882	−7.73	+0.906	20 12.2	19 19.0
2	.1697	13.70	1.0360	303 14	1.2767	288 40	0.8906	7.77	0.913	20 12.9	19 14.7
3	.1724	13.80	1.0373	303 25	1.2763	287 36	0.8929	7.81	0.920	20 13.6	19 10.4
4	.1751	13.91	1.0385	303 35	1.2759	286 31	0.8950	7.85	0.927	20 14.4	19 6.1
5	.1779	14.01	1.0398	303 46	1.2756	285 27	0.8970	7.89	0.934	20 15.1	19 1.8
h (11.0) 6	.1806	+14.12	1.0410	303 57	1.2752	284 22	*n*0.8989	−7.92	+0.941	20 15.8	18 57.5
7	.1833	14.22	1.0421	304 8	1.2749	283 17	0.9006	7.95	0.948	20 16.5	18 53.2
8	.1861	14.33	1.0433	304 18	1.2747	282 12	0.9021	7.98	0.955	20 17.2	18 48.8
9	.1888	14.43	1.0444	304 29	1.2744	281 8	0.9036	8.01	0.962	20 17.9	18 44.5
10	.1916	14.53	1.0455	304 40	1.2742	280 3	0.9049	8.03	0.969	20 18.7	18 40.2
11	.1943	+14.63	1.0466	304 51	1.2740	278 58	*n*0.9060	−8.05	+0.976	20 19.4	18 35.9
12	.1970	14.73	1.0477	305 1	1.2738	277 53	0.9071	8.07	0.982	20 20.1	18 31.5
13	.1998	14.84	1.0487	305 12	1.2736	276 48	0.9079	8.09	0.989	20 20.8	18 27.2
14	.2025	14.94	1.0498	305 23	1.2735	275 43	0.9087	8.10	0.996	20 21.5	18 22.9
15	.2052	15.04	1.0508	305 34	1.2734	274 38	0.9093	8.11	1.002	20 22.3	18 18.5
16	.2080	+15.14	1.0517	305 45	1.2733	273 33	*n*0.9098	−8.12	+1.009	20 23.0	18 14.2
17	.2107	15.24	1.0527	305 56	1.2732	272 28	0.9102	8.13	1.016	20 23.7	18 9.9
18	.2135	15.34	1.0536	306 7	1.2732	271 23	0.9104	8.14	1.022	20 24.4	18 5.5
19	.2162	15.44	1.0546	306 18	1.2731	270 18	0.9105	8.14	1.029	20 25.2	18 1.2
20	.2189	15.54	1.0555	306 29	1.2731	269 13	0.9105	8.14	1.036	20 25.9	17 56.9
h (12.0) 21	.2217	+15.64	1.0563	306 40	1.2732	268 8	*n*0.9103	−8.13	+1.043	20 26.7	17 52.6
22	.2244	15.74	1.0572	306 51	1.2732	267 4	0.9100	8.13	1.049	20 27.4	17 48.2
23	.2272	15.84	1.0580	307 3	1.2733	265 59	0.9096	8.12	1.056	20 28.2	17 43.9
24	.2299	15.94	1.0589	307 14	1.2734	264 54	0.9091	8.11	1.063	20 28.9	17 39.6
25	.2326	16.04	1.0597	307 26	1.2735	263 50	0.9084	8.10	1.069	20 29.7	17 35.3
26	.2254	+16.14	1.0605	307 37	1.2737	262 45	*n*0.9076	−8.08	+1.076	20 30.5	17 31.0
27	.2381	16.24	1.0613	307 49	1.2739	261 41	0.9066	8.06	1.083	20 31.3	17 26.7
28	.2408	16.34	1.0621	308 1	1.2741	260 36	0.9056	8.05	1.089	20 32.1	17 22.4
29	.2436	16.44	1.0628	308 13	1.2743	259 32	0.9044	8.02	1.096	20 32.9	17 18.1
30	.2463	16.54	1.0635	308 25	1.2745	258 28	0.9030	8.00	1.103	20 33.7	17 13.9
31	.2491	16.65	1.0644	308 37	1.2748	257 24	0.9016	7.97	1.110	20 34.5	17 9.6
Apr. 1	.2518	+16.75	1.0651	308 50	1.2751	256 20	*n*0.9000	−7.94	+1.117	20 35.2	17 5.4
2	.2545	16.85	1.0658	309 2	1.2754	255 16	0.8982	7.91	1.124	20 36.1	17 1.1
3	.2573	16.96	1.0666	309 15	1.2757	254 13	0.8964	7.88	1.131	20 37.0	16 56.8
4	.2600	17.06	1.0673	309 27	1.2760	253 9	0.8944	7.84	1.138	20 37.8	16 52.6
h (13.0) 5	.2627	17.17	1.0680	309 40	1.2764	252 6	0.8922	7.80	1.145	20 38.7	16 48.4
6	.2655	+17.28	1.0687	309 53	1.2768	251 3	*n*0.8900	−7.76	+1.152	20 39.5	16 44.2
7	.2682	17.38	1.0694	310 6	1.2772	249 59	0.8875	7.72	1.159	20 40.4	16 39.9
8	.2710	17.49	1.0702	310 19	1.2776	248 56	0.8850	7.67	1.166	20 41.3	16 35.7
9	.2737	17.60	1.0709	310 33	1.2781	247 53	0.8823	7.63	1.173	20 42.2	16 31.6
10	.2764	17.71	1.0716	310 46	1.2785	246 51	0.8794	7.57	1.181	20 43.1	16 27.4
11	.2792	+17.82	1.0723	311 0	1.2790	245 48	*n*0.8764	−7.52	+1.188	20 44.0	16 23.2
12	.2819	17.93	1.0730	311 13	1.2795	244 46	0.8733	7.47	1.196	20 44.9	16 19.1
13	.2846	18.04	1.0738	311 27	1.2800	243 44	0.8700	7.41	1.203	20 45.8	16 14.9
14	.2874	18.16	1.0745	311 41	1.2805	242 42	0.8666	7.35	1.211	20 46.8	16 10.8
15	.2901	18.27	1.0752	311 55	1.2810	241 40	0.8630	7.29	1.218	20 47.7	16 6.7
16	.2929	+18.39	1.0760	312 10	1.2815	240 39	*n*0.8593	−7.23	+1.226	20 48.6	16 2.6
17	.2956	18.50	1.0767	312 24	1.2821	239 37	0.8554	7.17	1.234	20 49.6	15 58.5
18	.2983	18.62	1.0775	312 38	1.2827	238 36	0.8513	7.10	1.241	20 50.6	15 54.4
19	.3011	18.74	1.0783	312 53	1.2832	237 35	0.8471	7.03	1.249	20 51.5	15 50.3
20	.3038	18.86	1.0790	313 8	1.2838	236 34	0.8427	6.96	1.257	20 52.5	15 46.3
h 21	.3066	+18.98	1.0798	313 23	1.2844	235 34	*n*0.8381	−6.89	+1.265	20 53.5	15 42.3
(14.0) 22	.3093	19.10	1.0806	313 37	1.2850	234 33	0.8334	6.81	1.273	20 54.5	15 38.2
23	.3120	19.22	1.0815	313 52	1.2856	233 33	0.8285	6.74	1.282	20 55.5	15 34.2
24	.3148	19.35	1.0823	314 8	1.2862	232 33	0.8234	6.66	1.290	20 56.5	15 30.2
25	.3175	19.48	1.0831	314 23	1.2868	231 32	0.8181	6.58	1.298	20 57.5	15 26.2
26	.3202	+19.60	1.0840	314 38	1.2875	230 34	*n*0.8127	−6.50	+1.307	20 58.5	15 22.3
27	.3230	19.73	1.0849	314 53	1.2881	229 35	0.8070	6.41	1.315	20 59.6	15 18.3
28	.3257	19.86	1.0858	315 9	1.2887	228 35	0.8012	6.33	1.324	21 0.6	15 14.4
29	.3285	19.99	1.0867	315 24	1.2893	227 36	0.7951	6.24	1.333	21 1.6	15 10.4
30	.3312	20.12	1.0876	315 40	1.2900	226 38	0.7889	6.15	1.342	21 2.7	15 6.5
31	0.3339	+20.26	1.0885	315 55	1.2906	225 39	*n*0.7824	−6.06	+1.350	21 3.7	15 2.6

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	τ.	f.	Log g.	G.	Log h.	H.	Log i.	i.	f.	G.	H.
	y	"		° ′		° ′		"	s	h m	h m
May 1	0.3339	+20.26	1.0885	315 55	1.2906	225 39	n0.7824	−6.06	+1.350	21 3.7	15 2.6
2	.3367	20.39	1.0895	316 11	1.2912	224 41	0.7757	5.97	1.359	21 4.7	14 58.7
3	.3394	20.53	1.0905	316 27	1.2919	223 43	0.7688	5.87	1.368	21 5.8	14 54.8
4	.3421	20.66	1.0915	316 43	1.2925	222 45	0.7616	5.78	1.378	21 6.8	14 51.0
5	.3449	20.80	1.0925	316 58	1.2931	221 47	0.7542	5.68	1.387	21 7.9	14 47.1
h (15.0) 6	.3476	+20.94	1.0936	317 14	1.2938	220 49	n0.7465	−5.58	+1.396	21 9.0	14 43.3
7	.3504	21.08	1.0946	317 30	1.2944	219 52	0.7386	5.48	1.406	21 10.0	14 39.5
8	.3531	21.22	1.0957	317 46	1.2950	218 55	0.7304	5.37	1.415	21 11.1	14 35.7
9	.3558	21.37	1.0969	318 2	1.2956	217 58	0.7220	5.27	1.425	21 12.1	14 31.8
10	.3586	21.51	1.0980	318 18	1.2962	217 1	0.7132	5.17	1.435	21 13.2	14 28.1
11	.3613	+21.66	1.0992	318 34	1.2968	216 4	n0.7042	−5.06	+1.444	21 14.2	14 24.3
12	.3640	21.81	1.1003	318 49	1.2974	215 8	0.6948	4.95	1.454	21 15.3	14 20.5
13	.3668	21.95	1.1016	319 5	1.2980	214 12	0.6851	4.84	1.464	21 16.3	14 16.8
14	.3695	22.10	1.1028	319 21	1.2986	213 15	0.6751	4.73	1.474	21 17.4	14 13.0
15	.3723	22.26	1.1040	319 37	1.2992	212 19	0.6647	4.62	1.484	21 18.4	14 9.3
16	.3750	+22.41	1.1053	319 52	1.2997	211 23	n0.6539	−4.51	+1.494	21 19.5	14 5.5
17	.3777	22.56	1.1066	320 8	1.3003	210 28	0.6427	4.39	1.504	21 20.5	14 1.8
18	.3805	22.72	1.1080	320 24	1.3009	209 32	0.6311	4.28	1.514	21 21.6	13 58.2
19	.3832	22.87	1.1093	320 39	1.3014	308 37	0.6191	4.16	1.525	21 22.6	13 54.5
20	.3860	23.03	1.1107	320 55	1.3019	207 42	0.6066	4.04	1.535	21 23.6	13 50.8
h (16.0) 21	.3887	+23.18	1.1121	321 10	1.3024	206 47	n0.5936	−3.92	+1.546	21 24.7	13 47.1
22	.3914	23.34	1.1135	321 25	1.3029	205 52	0.5801	3.80	1.556	21 25.7	13 43.5
23	.3942	23.50	1.1149	321 40	1.3034	204 57	0.5661	3.68	1.567	21 26.7	13 39.8
24	.3969	23.66	1.1164	321 55	1.3039	204 3	0.5514	3.56	1.577	21 27.7	13 36.2
25	.3996	23.83	1.1179	322 10	1.3044	203 8	0.5362	3.44	1.588	21 28.7	13 32.6
26	.4024	+23.99	1.1194	322 25	1.3048	202 14	n0.5202	−3.31	+1.599	21 29.7	13 28.9
27	.4051	24.15	1.1209	322 40	1.3052	201 20	0.5035	3.19	1.610	21 30.7	13 25.3
28	.4079	24.32	1.1225	322 54	1.3056	200 26	0.4860	3.06	1.621	21 31.6	13 21.7
29	.4106	24.48	1.1240	323 9	1.3060	199 32	0.4677	2.94	1.632	21 32.6	13 18.1
30	.4133	24.65	1.1256	323 23	1.3064	198 38	0.4485	2.81	1.643	21 33.5	13 14.6
31	.4161	24.82	1.1272	323 37	1.3068	197 45	0.4282	2.68	1.654	21 34.5	13 11.0
June 1	.4188	+24.98	1.1289	323 51	1.3072	196 51	n0.4069	−2.55	+1.666	21 35.4	13 7.4
2	.4215	25.15	1.1305	324 5	1.3075	195 58	0.3842	2.42	1.677	21 36.3	13 3.8
3	.4243	25.32	1.1321	324 19	1.3078	195 4	0.3602	2.29	1.688	21 37.2	13 0.3
4	.4270	25.49	1.1338	324 32	1.3081	194 11	0.3348	2.16	1.699	21 38.2	12 56.7
h (17.0) 5	.4298	25.66	1.1355	324 46	1.3084	193 18	0.3076	2.03	1.711	21 39.0	12 53.2
6	.4325	+25.83	1.1372	324 59	1.3087	192 25	n0.2784	−1.90	+1.722	21 39.9	12 49.7
7	.4352	26.00	1.1390	325 12	1.3089	191 32	0.2471	1.77	1.733	21 40.8	12 46.1
8	.4380	26.17	1.1407	325 25	1.3092	190 39	0.2131	1.63	1.745	21 41.6	12 42.6
9	.4407	26.35	1.1425	325 37	1.3094	189 46	0.1762	1.50	1.756	21 42.5	12 39.0
10	.4434	26.52	1.1442	325 50	1.3096	188 53	0.1357	1.37	1.768	21 43.3	12 35.5
11	.4462	+26.69	1.1460	326 2	1.3098	188 0	n0.0909	−1.23	+1.779	21 44 1	12 32.0
12	.4489	26.87	1.1478	326 14	1.3100	187 7	0.0407	1.10	1.791	21 44.9	12 28.5
13	.4517	27.04	1.1496	326 26	1.3101	186 15	0.9840	0.96	1.803	21 45.7	12 25.0
14	.4544	27.21	1.1514	326 38	1.3102	185 22	9.9185	0.83	1.814	21 46.5	12 21.5
15	.4571	27.39	1.1532	326 49	1.3103	184 29	9.8413	0.69	1.826	21 47.3	12 18.0
16	.4599	+27.56	1.1551	327 0	1.3104	183 37	n9.7473	−0.56	+1.838	21 48.0	12 14.5
17	.4626	27.74	1.1569	327 11	1.3105	182 44	9.6269	0.42	1.849	21 48.8	12 10.9
18	.4654	27.91	1.1588	327 22	1.3105	181 52	9.4596	0.29	1.861	21 49.5	12 7.4
19	.4681	28.09	1.1606	327 33	1.3106	180 59	9.1857	0.15	1.873	21 50.2	12 3.9
20	.4708	28.26	1.1625	327 43	1.3106	180 7	n8.2287	−0.02	1.884	21 50.9	12 0.4
h (18.0) 21	.4736	+28.44	1.1644	327 54	1.3106	179 14	p9.0721	+0.12	+1.896	21 51.6	11 56.9
22	.4763	28.61	1.1662	328 4	1.3106	178 22	9.4040	0.25	1.908	21 52.2	11 53.4
23	.4790	28.79	1.1681	328 13	1.3105	177 29	9.5898	0.39	1.919	21 52.9	11 49.9
24	.4818	28.96	1.1700	328 23	1.3105	176 37	9.7196	0.52	1.931	21 53.5	11 46.4
25	.4845	29.14	1.1719	328 33	1.3104	175 44	9.8190	0.66	1.943	21 54.2	11 42.9
26	.4873	+29.31	1.1738	328 42	1.3103	174 52	9.8999	+0.79	+1.954	21 54.8	11 39.4
27	.4900	29.49	1.1756	328 51	1.3101	173 59	9.9679	0.93	1.966	21 55.4	11 35.9
28	.4927	29.66	1.1775	329 0	1.3100	173 6	0.0266	1.06	1.977	21 56.0	11 32.4
29	.4955	29.83	1.1794	329 8	1.3098	172 14	0.0782	1.20	1.989	21 56.5	11 28.9
30	.4982	30.01	1.1813	329 17	1.3097	171 21	0.1242	1.33	2.000	21 57.1	11 25.4
31	0.5009	+30.18	1.1832	329 25	1.3095	170 28	0.1656	+1.46	+2.012	21 57.7	11 21.9

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	τ.	*f*.	Log *g*.	G.	Log *h*.	H.	Log *i*.	*i*.	*f*.	G.	H.
	y	″		° ′		° ′		″	s	h m	h m
July 1	0.5009	+30.18	1.1832	329 25	1.3095	170 28	0.1656	+1.46	+2.012	21 57.7	11 21.9
2	.5037	30.35	1.1850	329 33	1.3093	169 36	0.2034	1.60	2.023	21 58.2	11 18.4
3	.5064	30.52	1.1869	329 41	1.3090	168 43	0.2380	1.73	2.035	21 58.7	11 14.9
4	.5092	30.70	1.1888	329 48	1.3088	167 50	0.2700	1.86	2.046	21 59.2	11 11.3
5	.5119	30.87	1.1906	329 56	1.3085	166 57	0.2996	1.99	2.058	21 59.7	11 7.8
h (19.0) 6	.5146	+31.04	1.1925	330 3	1.3082	166 4	0.3272	+2.12	+2.069	22 0.2	11 4.3
7	.5174	31.21	1.1944	330 10	1.3079	165 11	0.3531	2.25	2.081	22 0.7	11 0.7
8	.5201	31.38	1.1962	330 17	1.3076	164 18	0.3774	2.38	2.092	22 1.1	10 57.2
9	.5228	31.55	1.1981	330 23	1.3073	163 25	0.4003	2.51	2.103	22 1.6	10 53.6
10	.5256	31.71	1.1999	330 30	1.3069	162 31	0.4220	2.64	2.114	22 2.0	10 50.1
11	.5283	+31.88	1.2017	330 36	1.3065	161 38	0.4425	+2.77	+2.125	22 2.4	10 46.5
12	.5311	32.05	1.2035	330 42	1.3062	160 44	0.4620	2.90	2.136	22 2.8	10 42.9
13	.5338	32.21	1.2054	330 48	1.3058	159 50	0.4805	3.02	2.147	22 3.2	10 39.4
14	.5365	32.37	1.2072	330 54	1.3054	158 57	0.4981	3.15	2.158	22 3.6	10 35.8
15	.5393	32.54	1.2089	331 0	1.3049	158 3	0.5150	3.27	2.169	22 4.0	10 32.2
16	.5420	+32.70	1.2107	331 5	1.3045	157 9	0.5311	+3.40	+2.180	22 4.4	10 28.6
17	.5448	32.86	1.2125	331 11	1.3041	156 15	0.5465	3.52	2.191	22 4.7	10 25.0
18	.5475	33.02	1.2143	331 16	1.3036	155 21	0.5612	3.64	2.201	22 5.0	10 21.4
19	.5502	33.18	1.2160	331 21	1.3031	154 26	0.5754	3.76	2.212	22 5.4	10 17.7
20	.5530	33.34	1.2177	331 25	1.3026	153 31	0.5890	3.88	2.223	22 5.7	10 14.1
h (20.0) 21	.5557	+33.50	1.2195	331 30	1.3021	152 37	0.6021	+4.00	+2.233	22 6.0	10 10.5
22	.5584	33.65	1.2212	331 35	1.3016	151 43	0.6147	4.12	2.244	22 6.3	10 6.8
23	.5612	33.81	1.2229	331 39	1.3011	150 48	0.6268	4.23	2.254	22 6.6	10 3.2
24	.5639	33.96	1.2245	331 44	1.3005	149 53	0.6385	4.35	2.264	22 6.9	9 59.5
25	.5667	34.12	1.2262	331 48	1.3000	148 57	0.6497	4.46	2.275	22 7.2	9 55.8
26	.5694	+34.27	1.2279	331 52	1.2994	148 2	0.6605	+4.58	+2.285	22 7.5	9 52.2
27	.5721	34.42	1.2295	331 56	1.2989	147 7	0.6710	4.69	2.295	22 7.7	9 48.5
28	.5749	34.57	1.2311	332 0	1.2983	146 11	0.6811	4.80	2.305	22 8.0	9 44.8
29	.5776	34.72	1.2328	332 3	1.2977	145 15	0.6909	4.91	2.315	22 8.2	9 41.0
30	.5803	34.87	1.2343	332 7	1.2971	144 19	0.7003	5.02	2.324	22 8.5	9 37.3
31	.5831	35.01	1.2359	332 11	1.2965	143 23	0.7094	5.12	2.334	22 8.7	9 33.6
Aug. 1	.5858	+35.16	1.2375	332 14	1.2959	142 27	0.7182	+5.23	+2.344	22 8.9	9 29.8
2	.5886	35.30	1.2390	332 17	1.2953	141 31	0.7267	5.33	2.353	22 9.2	9 26.0
3	.5913	35.44	1.2406	332 21	1.2947	140 34	0.7350	5.43	2.363	22 9.4	9 22.3
4	.5940	35.58	1.2421	332 24	1.2941	139 37	0.7429	5.53	2.372	22 9.6	9 18.5
h (21.0) 5	.5968	35.72	1.2436	332 27	1.2934	138 40	0.7506	5.63	2.382	22 9.8	9 14.7
6	.5995	+35.86	1.2451	332 30	1.2928	137 43	0.7581	+5.73	+ 2.391	22 10.0	9 10.8
7	.6022	36.00	1.2466	332 33	1.2922	136 46	0.7653	5.83	2.400	22 10.2	9 7.1
8	.6050	36.14	1.2480	332 36	1.2916	135 48	0.7723	5.92	2.409	22 10.4	9 3.2
9	.6077	36.27	1.2494	332 38	1.2910	134 50	0.7790	6.01	2.418	22 10.6	8 59.3
10	.6104	36.40	1.2508	332 41	1.2903	133 52	0.7856	6.10	2.427	22 10.7	8 55.5
11	.6132	+36.54	1.2522	332 44	1.2897	132 54	0.7919	+6.19	+2.436	22 10.9	8 51.6
12	.6159	36.67	1.2536	332 46	1.2891	131 56	0.7980	6.28	2.444	22 11.1	8 47.7
13	.6187	36.80	1.2550	332 49	1.2884	130 57	0.8039	6.37	2.453	22 11.3	8 43.8
14	.6214	36.92	1.2563	332 51	1.2878	129 58	0.8096	6.45	2.462	22 11.4	8 39.9
15	.6241	37.05	1.2577	332 54	1.2872	129 0	0.8151	6.53	2.470	22 11.6	8 36.0
16	.6269	+37.18	1.2590	332 56	1.2866	128 1	0.8204	+6.61	+2.478	22 11.8	8 32.0
17	.6296	37.30	1.2603	332 59	1.2860	127 1	0.8256	6.69	2.487	21 11.9	8 28.1
18	.6324	37.43	1.2616	333 1	1.2854	126 2	0.8305	6.77	2.495	22 12.1	8 24.1
19	.6351	37.55	1.2628	333 4	1.2848	125 2	0.8353	6.84	2.503	22 12.2	8 20.2
h (22.0) 20	.6378	37.67	1.2641	333 6	1.2842	124 3	0.8399	6.92	2.511	22 12.4	8 16.2
21	.6406	+37.79	1.2653	333 8	1.2836	123 2	0.8444	+6.99	+2.519	22 12.6	8 12.2
22	.6433	37.91	1.2665	333 11	1.2830	122 2	0.8486	7.06	2.527	22 12.7	8 8.2
23	.6461	38.03	1.2677	333 13	1.2825	121 2	0.8528	7.12	2.535	22 12.9	8 4.1
24	.6488	38.14	1.2689	333 16	1.2819	120 1	0.8567	7.19	2.543	22 13.0	8 0.1
25	.6515	38.26	1.2701	333 18	1.2814	119 1	0.8605	7.25	2.551	22 13.2	7 56.0
26	.6543	+38.37	1.2712	333 20	1.2808	118 0	0.8642	+7.31	+2.558	22 13.4	7 52.0
27	.6570	38.49	1.2724	333 23	1.2803	116 59	0.8677	7.37	2.566	22 13.5	7 47.9
28	.6597	38.60	1.2735	333 25	1.2798	115 58	0.8710	7.43	2.573	22 13.7	7 43.9
29	.6625	38.71	1.2746	333 28	1.2793	114 56	0.8742	7.48	2.581	22 13.8	7 39.8
30	.6652	38.82	1.2757	333 30	1.2789	113 55	0.8773	7.54	2.588	22 14.0	7 35.7
31	0.6680	+38.93	1.2767	333 33	1.2784	112 53	0.8802	+7.59	+2.595	22 14.2	7 31.5

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.	τ.	*f*.	Log *g*.	G.	Log *h*.	H.	Log *i*.	*i*.	*f*.	G.	H.
	y	″		° ′		° ′		″	s	h m	h m
Sept. 1	0.6707	+39.04	1.2778	333 35	1.2780	111 51	0.8830	+7.64	+2.603	22 14.3	7 27.4
2	.6734	39.15	1.2788	333 38	1.2775	110 49	0.8856	7.68	2.610	22 14.5	7 23.3
3	.6762	39.25	1.2799	333 40	1.2771	109 47	0.8881	7.73	2.617	22 14.7	7 19.1
h 4	.6789	39.36	1.2809	333 43	1.2767	108 44	0.8904	7.77	2.624	22 14.9	7 15.0
(23.0) 5	.6816	39.47	1.2819	333 45	1.2763	107 42	0.8927	7.81	2.631	22 15.0	7 10.8
6	.6844	+39.57	1.2829	333 48	1.2760	106 39	0.8947	+7.85	+2.638	22 15.2	7 6.6
7	.6871	39.68	1.2838	333 51	1.2756	105 36	0.8967	7.88	2.645	22 15.4	7 2.4
8	.6899	39.78	1.2848	333 54	1.2753	104 34	0.8985	7.92	2.652	22 15.6	6 58.2
9	.6926	39.88	1.2857	333 57	1.2750	103 30	0.9002	7.95	2.659	22 15.8	6 54.0
10	.6953	39.99	1.2867	333 59	1.2747	102 27	0.9018	7.98	2.666	22 16.0	6 49.8
11	.6981	+40.09	1.2876	334 2	1.2745	101 24	0.9032	+8.00	+2.673	22 16.2	6 45.6
12	.7008	40.19	1.2885	334 6	1.2742	100 21	0.9045	8.03	2.679	22 16.4	6 41.4
13	.7035	40.29	1.2894	334 9	1.2740	99 17	0.9057	8.05	2.686	22 16.6	6 37.2
14	.7063	40.39	1.2903	334 12	1.2738	98 14	0.9067	8.07	2.693	22 16.8	6 32.9
15	.7090	40.49	1.2912	334 15	1.2737	97 10	0.9077	8.09	2.699	22 17.0	6 28.7
16	.7118	+40.59	1.2920	334 19	1.2735	96 6	0.9084	+8.10	+2.706	22 17.2	6 24.4
17	.7145	40.69	1.2929	334 22	1.2734	95 3	0.9091	8.11	2.713	22 17.5	6 20.2
18	.7172	40.79	1.2938	334 25	1.2733	93 59	0.9096	8.12	2.719	22 17.7	6 15.9
19	.7200	40.89	1.2946	334 29	1.2732	92 55	0.9101	8.13	2.726	22 17.9	6 11.6
h 20	.7227	40.99	1.2954	334 32	1.2732	91 51	0.9103	8.13	2.733	22 18.2	6 7.4
(0.0) 21	.7255	+41.09	1.2963	334 36	1.2731	90 46	0.9105	+8.14	+2.739	22 18.4	6 3.1
22	.7282	41.18	1.2971	334 40	1.2731	89 42	0.9105	8.14	2.746	22 18.7	5 58.8
23	.7309	41.28	1.2979	334 44	1.2731	88 38	0.9104	8.14	2.752	22 18.9	5 54.6
24	.7337	41.38	1.2987	334 48	1.2732	87 35	0.9102	8.13	2.759	22 19.2	5 50.3
25	.7364	41.48	1.2995	334 52	1.2733	86 31	0.9098	8.12	2.765	22 19.5	5 46.0
26	.7391	+41.58	1.3003	334 56	1.2733	85 26	0.9093	+8.11	+2.772	22 19.8	5 41.7
27	.7419	41.68	1.3011	335 0	1.2734	84 22	0.9087	8.10	2.779	22 20.0	5 37.5
28	.7446	41.78	1.3019	335 5	1.2736	83 18	0.9080	8.09	2.785	22 20.3	5 33.2
29	.7474	41.88	1.3026	335 9	1.2738	82 14	0.9071	8.07	2.792	22 20.6	5 28.9
30	.7501	41.98	1.3034	335 14	1.2739	81 10	0.9061	8.06	2.799	22 20.9	5 24.6
Oct. 1	.7528	+42.08	1.3042	335 18	1.2742	80 5	0.9050	+8.03	+2.805	22 21.2	5 20.4
2	.7556	42.18	1.3049	335 23	1.2744	79 1	0.9037	8.01	2.812	22 21.5	5 16.1
3	.7583	42.28	1.3057	335 28	1.2747	77 57	0.9023	7.99	2.819	22 21.9	5 11.8
h 4	.7610	42.39	1.3065	335 33	1.2749	76 53	0.9008	7.96	2.826	22 22.2	5 7.5
(1.0) 5	.7638	42.49	1.3072	335 38	1.2752	75 49	0.8991	7.93	2.833	22 22.5	5 3.3
6	.7665	+42.59	1.3080	335 43	1.2755	74 45	0.8973	+7.89	+2.840	22 22.9	4 59.0
7	.7693	42.70	1.3088	335 48	1.2759	73 41	0.8954	7.86	2.846	22 23.2	4 54.8
8	.7720	42.80	1.3095	335 53	1.2762	72 37	0.8933	7.82	2.853	22 23.6	4 50.5
9	.7747	42.91	1.3103	335 59	1.2766	71 34	0.8911	7.78	2.861	22 23.9	4 46.3
10	.7775	43.01	1.3111	336 4	1.2770	70 30	0.8887	7.74	2.868	22 24.3	4 42.0
11	.7802	+43.12	1.3118	336 10	1.2774	69 27	0.8862	+7.69	+2.875	22 24.7	4 37.8
12	.7829	43.23	1.3126	336 15	1.2778	68 23	0.8836	7.65	2.882	22 25.0	4 33.5
13	.7857	43.34	1.3134	336 21	1.2783	67 20	0.8808	7.60	2.889	22 25.4	4 29.3
14	.7884	43.44	1.3141	336 27	1.2788	66 16	0.8778	7.55	2.896	22 25.8	4 25.1
15	.7912	43.55	1.3149	336 33	1.2793	65 13	0.8747	7.49	2.904	22 26.2	4 20.9
16	.7939	+43.67	1.3157	336 39	1.2798	64 10	0.8714	+7.44	+2.911	22 26.6	4 16.7
17	.7966	43.78	1.3165	336 45	1.2803	63 7	0.8680	7.38	2.919	22 27.0	4 12.5
18	.7994	43.89	1.3173	336 51	1.2808	62 4	0.8644	7.32	2.926	22 27.4	4 8.3
h 19	.8021	44.01	1.3181	336 57	1.2813	61 1	0.8607	7.26	2.934	22 27.8	4 4.1
(2.0) 20	.8049	44.12	1.3189	337 3	1.2819	59 59	0.8568	7.19	2.942	22 28.2	3 59.9
21	.8076	+44.24	1.3197	337 10	1.2825	58 56	0.8527	+7.12	+2.949	22 28.7	3 55.8
22	.8103	44.36	1.3205	337 16	1.2831	57 54	0.8484	7.05	2.957	22 29.1	3 51.6
23	.8131	44.84	1.3214	337 23	1.2836	56 52	0.8440	6.98	2.965	22 29.5	3 47.4
24	.8158	44.60	1.3222	337 29	1.2843	55 49	0.8394	6.91	2.973	22 29.9	3 43.3
25	.8185	44.72	1.3231	337 36	1.2849	54 48	0.8346	6.83	2.981	22 30.4	3 39.2
26	.8213	44.48	1.3239	337 42	1.2855	53 46	0.8296	6.75	2.990	22 30.8	3 35.0
27	.8240	+44.97	1.3248	337 49	1.2861	52 44	0.8244	+6.67	+2.998	22 31.3	3 30.9
28	.8268	45.10	1.3256	337 56	1.2868	51 43	0.8190	6.59	3.006	22 31.7	3 26.8
29	.8295	45.22	1.3265	338 3	1.2874	50 41	0.8134	6.51	3.015	22 32.2	3 22.7
30	.8322	45.35	1.3274	338 9	1.2880	49 40	0.8076	6.42	3.023	22 32.6	3 18.7
31	.8350	45.48	1.3283	338 16	1.2887	48 39	0.8016	6.33	3.032	22 33.1	3 14.6
32	0.8377	+45.61	1.3292	338 23	1.2893	47 38	0.7953	+6.24	+3.041	22 33.5	3 10.5

FOR WASHINGTON MEAN MIDNIGHT.

QUANTITIES FOR REDUCING MEAN PLACES, 1877.0, TO APPARENT PLACES.

Solar day. Sid. hour.		τ.	f.	Log g.	G.	Log h.	H.	Log i.	i.	f.	G.	H.
		y	"		° ′		° ′		"	s	h m	h m
Nov.	1	0.8377	+45.61	1.3292	338 23	1.2893	47 38	0.7953	+6.24	+3.041	22 33.5	3 10.5
	2	.8404	45.74	1.3301	338 30	1.2900	46 37	0.7889	6.15	3.050	22 34.0	3 6.5
h	3	.8432	45.88	1.3310	338 37	1.2906	45 37	0.7821	6.05	3.059	22 34.5	3 2.5
(3.0)	4	.8459	46.01	1.3320	338 44	1.2913	44 37	0.7752	5.96	3.068	22 34.9	2 58.5
	5	.8487	46.15	1.3329	338 51	1.2920	43 36	0.7680	5.86	3.077	22 35.4	2 54.4
	6	.8514	+46.29	1.3339	338 58	1.2926	42 36	0.7605	+5.76	+3.086	22 35.9	2 50.4
	7	.8541	46.43	1.3349	339 5	1.2933	41 36	0.7528	5.66	3.095	22 36.3	2 46.4
	8	.8569	46.57	1.3359	339 12	1.2939	40 36	0.7448	5.56	3.105	22 36.8	2 42.4
	9	.8596	46.71	1.3369	339 19	1.2946	39 37	0.7365	5.45	3.114	22 37.3	2 38.4
	10	.8623	46.86	1.3379	339 26	1.2952	38 37	0.7279	5.34	3.124	22 37.7	2 34.5
	11	.8651	+47.01	1.3389	339 33	1.2959	37 38	0.7189	+5.23	+3.134	22 38.2	2 30.5
	12	.8678	47.15	1.3399	339 40	1.2965	36 38	0.7097	5.12	3.144	22 38.7	2 26.6
	13	.8706	47.30	1.3409	339 47	1.2971	35 39	0.7001	5.01	3.153	22 39.1	2 22.6
	14	.8733	47.45	1.3420	339 54	1.2978	34 40	0.6901	4.90	3.163	22 39.6	2 18.7
	15	.8760	47.60	1.3431	340 1	1.2984	33 41	0.6798	4.78	3.174	22 40.0	2 14.8
	16	.8788	+47.76	1.3442	340 8	1.2990	32 43	0.6691	+4.67	+3.184	22 40.5	2 10.9
	17	.8815	47.91	1.3452	340 14	1.2996	31 44	0.6579	4.55	3.194	22 41.0	2 7.0
	18	.8843	48.07	1.3463	340 21	1.3002	30 46	0.6464	4.43	3.204	22 41.4	2 3.1
h	19	.8870	48.22	1.3475	340 28	1.3007	29 48	0.6343	4.31	3.215	22 41.9	1 59.2
(4.0)	20	.8897	48.38	1.3486	340 35	1.3013	28 49	0.6218	4.19	3.225	22 42.3	1 55.3
	21	.8925	+48.54	1.3497	340 41	1.3018	27 51	0.6088	+4.06	+3.236	22 42.8	1 51.4
	22	.8952	48.70	1.3508	340 48	1.3024	26 53	0.5952	3.94	3.247	22 43.2	1 47.6
	23	.8979	48.86	1.3520	340 55	1.3029	25 56	0.5810	3.81	3.258	22 43.6	1 43.7
	24	.9007	49.03	1.3532	341 1	1.3034	24 58	0.5663	3.68	3.268	22 44.1	1 39.9
	25	.9034	49.19	1.3543	341 7	1.3039	24 1	0.5508	3.55	3.279	22 44.5	1 36.0
	26	.9062	+49.36	1.3555	341 14	1.3044	23 3	0.5346	+3.42	+3.291	22 44.9	1 33.2
	27	.9089	49.52	1.3567	341 20	1.3049	22 6	0.5177	3.29	3.302	22 45.3	1 28.4
	28	.9116	49.69	1.3579	341 26	1.3053	21 9	0.4999	3.16	3.313	22 45.8	1 24.6
	29	.9144	49.86	1.3592	341 33	1.3058	20 11	0.4812	3.03	3.324	22 46.2	1 20.8
	30	.9171	50.03	1.3604	341 39	1.3062	19 14	0.4615	2.90	3.335	22 46.6	1 17.0
Dec.	1	.9198	+50.20	1.3616	341 45	1.3066	18 17	0.4407	+2.76	+3.347	22 47.0	1 13.2
	2	.9226	50.37	1.3629	341 51	1.3070	17 21	0.4187	2.62	3.358	22 47.4	1 9.4
	3	.9253	50.55	1.3641	341 56	1.3074	16 24	0.3955	2.49	3.370	22 47.8	1 5.6
h	4	.9281	50.72	1.3654	342 2	1.3077	15 27	0.3707	2.35	3.382	22 48.1	1 1.8
(5.0)	5	.9308	50.90	1.3666	342 8	1.3080	14 30	0.3443	2.21	3.393	22 48.5	0 58.0
	6	.9335	+51.07	1.3679	342 13	1.3083	13 34	0.3160	+2.07	+3.405	22 48.9	0 54.3
	7	.9363	51.25	1.3692	342 19	1.3086	12 37	0.2856	1.93	3.417	22 49.2	0 50.5
	8	.9390	51.42	1.3705	342 24	1.3089	11 41	0.2528	1.79	3.428	22 49.6	0 46.7
	9	.9417	51.60	1.3717	342 29	1.3092	10 45	0.2171	1.65	3.440	22 49.9	0 43.0
	10	.9445	51.78	1.3730	342 34	1.3094	9 48	0.1781	1.51	3.452	22 50.3	0 39.2
	11	.9472	+51.96	1.3743	342 39	1.3096	8 52	0.1350	+1.36	+3.464	22 50.6	0 35.5
	12	.9500	52.14	1.3756	342 44	1.3098	7 56	0.0871	1.22	3.476	22 50.9	0 31.7
	13	.9527	52.32	1.3769	342 49	1.3100	7 0	0.0330	1.08	3.488	22 51.3	0 28.0
	14	.9554	52.50	1.3783	342 53	1.3101	6 3	9.9710	0.94	3.500	22 51.6	0 24.2
	15	.9582	52.68	1.3796	342 58	1.3103	5 7	9.8986	0.79	3.512	22 51.9	0 20.5
	16	.9609	+52.86	1.3809	343 2	1.3104	4 11	1.8113	+0.65	+3.524	22 52.2	0 16.7
	17	.9637	53.04	1.3822	343 7	1.3105	3 15	9.7019	0.50	3.536	22 52.5	0 13.0
	18	.9664	53.22	1.3835	343 11	1.3105	2 19	9.5550	0.36	3.548	22 52.7	0 9.3
h	19	.9691	53.40	1.3849	343 15	1.3106	1 23	9.3310	0.21	3.560	22 53.0	0 5.5
(6.0)	20	.9719	53.59	1.3862	343 19	1.3106	0 27	p8.8429	+0.07	3.572	22 53.3	0 1.8
	21	.9746	+53.77	1.3875	343 23	1.3106	359 31	n8.8754	−0.08	+3.585	22 53.5	23 58.1
	22	.9773	53.95	1.3888	343 27	1.3106	358 35	9.3418	0.22	3.597	22 53.8	23 54.3
	23	.9801	54.13	1.3902	343 30	1.3105	357 39	9.5616	0.36	3.609	22 54.0	23 50.6
	24	.9828	54.31	1.3915	343 34	1.3104	356 43	9.7067	0.51	3.621	22 54.2	23 46.8
	25	.9856	54.49	1.3928	343 37	1.3104	355 46	9.8151	0.65	3.633	22 54.5	23 43.1
	26	.9883	54.68	1.3941	343 40	1.3102	354 50	9.9017	0.80	3.645	22 54.7	23 39.3
	27	.9910	+54.86	1.3954	343 43	1.3101	353 54	n9.9738	−0.94	+3.657	22 54.9	23 35.6
	28	.9938	55.04	1.3967	343 46	1.3100	352 58	0.0355	1.09	3.669	22 55.1	23 31.9
	29	.9965	55.22	1.3981	343 49	1.3098	352 1	0.0894	1.23	3.681	22 55.3	23 28.1
	30	0.9992	55.40	1.3994	343 52	1.3096	351 5	0.1372	1.37	3.693	22 55.5	23 24.3
	31	1.0020	55.58	1.4007	343 55	1.3094	350 9	0.1801	1.51	3.705	22 55.7	23 20.4
	32	1.0047	+55.75	1.4020	343 57	1.3092	349 12	n0.2190	−1.66	+3.717	22 55.8	23 16.8

BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

WITH DR. PETERS'S COEFFICIENTS, AND BESSEL'S NOTATION.

$A = \tau - 0.34245 \sin \text{☊} + 0.00410 \sin 2\,\text{☊} - 0.02519 \sin 2\odot + 0.00293 \sin (\odot + 82^\circ\ 14')$.

$B = -9''.2238 \cos \text{☊} + 0''.0895 \cos 2\,\text{☊} - 0''.5507 \cos 2\odot - 0''.0092 \cos (\odot + 280^\circ\ 49')$.

$C = -20''.4451 \cos \omega \cos \odot$.

$D = -20''.4451 \sin \odot$.

$E = -0''.0465 \sin \text{☊} + 0''.0014 \sin 2\,\text{☊} - 0''.0033 \sin 2\odot$.

$a = 3^s.07229 + 1^s.33693 \sin \alpha \tan \delta$.

$b = \frac{1}{15} \cos \alpha \tan \delta$.

$c = \frac{1}{15} \cos \alpha \sec \delta$.

$d = \frac{1}{15} \sin \alpha \sec \delta$.

$a' = 20''.0540 \cos \alpha$.

$b' = -\sin \alpha$.

$c' = \tan \omega \cos \delta - \sin \alpha \sin \delta$.

$d' = \cos \alpha \sin \delta$.

μ = the annual proper motion in right ascension.

μ' = the annual proper motion in declination.

τ = the time reckoned from Jan. 0^d—.469, (when the sun's mean longitude is 280°,) and expressed in fractional parts of a tropical year.

$\odot$ = the sun's true longitude.

Ω = the longitude of the moon's ascending node.

ω = the obliquity of the ecliptic.

α = the star's mean right ascension for the beginning of the year.

δ = the star's mean declination for the beginning of the year.

α' = the star's apparent right ascension at the time τ.

δ' = the star's apparent declination at the time τ.

$\alpha' - \alpha = Aa + Bb + Cc + Dd + E + \tau\mu$ (in time)

$\delta' - \delta = Aa' + Bb' + Cc' + Dd' + \tau\mu'$. (in arc)

The following formulæ may also be used by putting

$f = 46''.0843\,A + E = 3^s.07229\,A + \frac{1}{15} E$ $\qquad i = C \tan \omega$.

$g \cos G = 20''.0540\,A$. $\qquad h \sin H = C$.

$g \sin G = B$. $\qquad h \cos H = D$.

$\alpha' - \alpha = f + \tau\mu + g \sin (G + \alpha) \frac{\tan \delta}{15} + h \sin (H + \alpha) \frac{\sec \delta}{15}$. (in time)

$\delta' - \delta = \tau\mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta + i \cos \delta$. (in arc)

A and B include also the following small terms of nutation, the combined values of which in 1877 are given in Table V. of the Appendix.

$\triangle A = +.00025 \sin (2\odot - \Omega) + .00009 \sin (2\Gamma - \Omega)$.
$\quad + .00010 \sin 2(\odot - \Gamma') + .00005 \cos \Gamma'$.
$\quad - .00005 \sin 2(\odot - \Omega) + .00004 \sin 2\Gamma'$
$\quad - .00011 \sin (3\odot - \Gamma)$.

$\triangle B = +0''.0067 \cos (2\odot - \Omega)$.
$\quad - 0.0027 \cos (3\odot - \Gamma)$.
$\quad + 0.0024 \cos (2\Gamma' - \Omega)$.
$\quad - 0.0023 \sin \Gamma'$.
$\quad + 0.0008 \sin 2\Gamma'$.

Table IV. of the Appendix contains the following terms:

$A_{\text{☾}} = -.00405 \sin 2\,\text{☾}$. $\qquad B_{\text{☾}} = -0''.0885 \cos 2\,\text{☾}$.

$A'_{\text{☾}} = +.00135 \sin (\text{☾} - \Gamma')$.

Tables VI. and VII. facilitate finding the corresponding reductions of Right Ascensions and Declinations. In these terms.

☾ = the moon's mean longitude.

Γ = the longitude of the sun's perigee.

Γ' = the longitude of the moon's perigee.

Other terms, which become sensible for stars very near the pole, will be found on page 465.

MEAN PLACES FOR 1877.0. (Jan. 0—^{d}.469, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		h m s	s	° ′ ″	″
α Andromedæ . . .	2	0 2 1.911	+ 3.089	+28 24 41.49	+19.91
γ Pegasi (*Algenib*) .	3.2	0 6 54.198	3.084	+14 29 59.64	20.05
• β Hydri	3	0 19 15.391	3.248	−77 56 52.72	20.25
α Cassiopeæ . . .	var.	0 33 32.239	3.368	+55 51 44.65	19.80
β Ceti	2	0 37 24.834	3.013	−18 39 42.91	19.83
• 21 Cassiopeæ . . .	6	0 37 33.198	+ 3.838	+74 18 53.22	+19.72
ε Piscium	4	0 56 33.641	3.110	+ 7 13 39.41	19.48
• α Ursæ Min. (*Polaris*)	2	1 13 42.205	21.173	+88 39 11.88	19.02
θ¹ Ceti	3	1 17 52.529	2.997	− 8 49 5.53	18.71
• 38 Cassiopeæ . . .	6	1 22 6.129	4.360	+69 37 50.30	18.70
η Piscium	4.3	1 24 54.121	+ 3.200	+14 42 41.23	+18.71
α Eridani (*Achernar*)	1	1 33 7.665	2.234	−57 51 42.60	18.41
ο Piscium	4	1 38 54.045	3.163	+ 8 32 16.89	18.26
β Arietis	3.2	1 47 50.841	3.301	+20 12 22.58	17.78
• 50 Cassiopeæ . . .	4	1 52 57.842	4.988	+71 49 28.12	17.66
α Arietis	2	2 0 14.530	+ 3.369	+22 52 48.44	+17.22
ξ¹ Ceti	4.5	2 6 28.850	3.170	+ 8 16 7.88	17.07
• ι Cassiopeæ . . .	4	2 18 57.043	4.846	+66 50 51.12	16.46
γ Ceti	3.4	2 36 55.703	3.103	+ 2 42 59.48	15.38
α Ceti	2.3	2 55 51.040	3.129	+ 3 36 21.63	14.35
• 48 Cephei (H.) . . .	6	3 4 46.682	+ 7.363	+77 16 45.86	+13.81
ζ Arietis	4.5	3 7 50.019	3.438	+20 35 15.44	13.63
α Persei	2	3 15 32.868	4.250	+49 25 17.24	13.14
δ Persei	3	3 34 10.253	4.242	+47 23 31.75	11.86
η Tauri	3	3 40 10.478	3.555	+23 43 23.89	11.44
ζ Persei	3	3 46 24.168	+ 3.757	+31 30 59.83	+11.01
γ¹ Eridani	3	3 52 17.457	2.796	−13 51 33.62	10.52
γ Tauri	4	4 12 47.685	3.408	+15 19 45.20	9.04
ε Tauri	4.3	4 21 26.124	3.496	+18 54 22.41	8.35
α Tauri (*Aldebaran*) .	1	4 28 51.843	3.437	+16 15 38.16	7.60
• 9 Camelopardalis . .	4	4 41 49.844	+ 5.917	+66 7 50.75	+ 6.71
ι Aurigæ	3	4 48 59.097	3.898	+32 58 10.31	6.10
11 Orionis	5	4 57 32.549	3.425	+15 13 52.55	5.39
α Aurigæ (*Capella*) .	1	5 7 36.289	4.423	+45 52 14.01	4.12
β Orionis (*Rigel*) . .	1	5 8 37.622	2.881	− 8 20 42.60	4.46
β Tauri	2	5 18 31.028	+ 3.788	+28 30 5.64	+ 3.43
• Groombridge 966 .	6.7	5 23 17.603	7.992	+74 57 28.00	3.19
δ Orionis	2	5 25 43.422	3.064	− 0 23 30.68	2.97
α Leporis	3	5 27 18.407	2.646	−17 54 41.40	2.88
ε Orionis	2	5 29 58.348	3.042	− 1 16 55.22	2.62
α Columbæ	2	5 35 11.784	+ 2.173	−34 8 25.90	+ 2.14
α Orionis	var.	5 48 30.797	3.247	+ 7 22 57.00	+ 1.02
• 22 Camelopardalis (H.)	5.4	6 5 17.170	6.619	+69 21 34.46	− 0.58
μ Geminorum . . .	3	6 15 31.192	3.633	+22 34 29.88	1.47
α Argus (*Canopus*) .	1	6 21 13.392	1.330	−52 37 44.98	1.86
γ Geminorum . . .	2.8	6 30 36.398	+ 3.469	+16 30 9.68	− 2.70
α Canis Maj. (*Sirius*) .	1	6 39 43.644	2.645	−16 32 54.96	4.67
• 51 Cephei (H.) . . .	5	6 42 14.861	30.194	+87 13 57.07	3.72
ε Canis Majoris . .	2.1	6 53 47.595	2.359	−28 48 20.96	4.66
δ Canis Majoris . .	2	7 3 23.472	+ 2.440	−26 11 55.11	− 5.44

• Circumpolar Stars.

MEAN PLACES FOR 1877.0. (Jan. 0—^{d}.469, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		h m s	s	° ′ ″	″
δ Geminorum . . .	3.4	7 12 46.616	+ 3.590	+22 12 26.06	− 6.25
* Piazzi vii. 67 . . .	6	7 18 4.042	6.309	+68 42 48.19	6.77
α Geminor. (*Castor*) .	2.1	7 26 44.724	3.838	+32 9 22.90	7.49
α Can. Min. (*Procyon*)	1	7 32 51.851	3.146	+ 5 32 19.03	8.95
β Geminor. (*Pollux*) .	1.2	7 37 47.276	3.681	+28 19 18.33	8.34
φ Geminorum . . .	5	7 45 58.144	+ 3.683	+27 4 57.16	− 8.96
* 3 Ursæ Majoris (H.) .	6	8 0 33.103	6.063	+68 49 59.49	10.08
15 Argus (ι)	3	8 2 18.438	2.557	−23 57 2.07	10.13
ε Hydræ	3.4	8 40 15.751	3.184	+ 6 52 8.91	12.93
ι Ursæ Majoris . .	3	8 50 46.706	4.138	+48 31 22.61	13.86
* σ² Ursæ Majoris . .	5	8 59 32.797	+ 5.871	+67 37 52.90	−14.25
κ Cancri	5	9 1 5.021	3.255	+11 9 44.35	14.23
ι Argus	2	9 13 47.758	1.602	−58 45 31.55	14.93
* 1 Draconis (H.) . .	4.5	9 19 24.171	9.097	+81 52 3.26	15.33
α Hydræ	2	9 21 32.602	2.949	− 8 7 34.28	15.41
* d Ursæ Majoris . .	5.4	9 23 34.383	+ 5.421	+70 22 8.55	−15.51
θ Ursæ Majoris . .	3	9 24 37.189	4.048	+52 14 11.95	16.17
ε Leonis	3	9 38 52.058	3.419	+24 20 23.42	16.38
μ Leonis	4	9 45 45.896	3.424	+26 35 7.64	16.76
α Leonis (*Regulus*) .	1.2	10 1 49.256	3.203	+12 34 4.56	17.43
* 32 Ursæ Majoris . .	6	10 9 4.888	+ 4.434	+65 43 14.43	−17.79
γ¹ Leonis	2	10 13 11.345	3.316	+20 27 48.03	18.04
* 9 Draconis (H.) . .	5.4	10 24 35.633	5.296	+76 20 43.27	18.37
ρ Leonis	4	10 26 20.088	3.165	+ 9 56 20.61	18.40
η Argus	2	10 40 17.532	2.311	−59 2 14.05	18.76
l Leonis	5	10 42 47.450	+ 3.159	+11 11 45.13	−18.93
α Ursæ Majoris . .	2	10 56 7.347	3.756	+62 24 51.91	19.37
δ Leonis	2.8	11 7 33.967	3.201	+21 11 51.18	19.65
δ Crateris	3.4	11 13 11.553	2.996	−14 6 46.60	19.44
τ Leonis	5	11 21 36.730	3.088	+ 3 22 0.96	19.79
* λ Draconis	3.4	11 24 4.834	+ 3.635	+70 0 33.30	−19.86
υ Leonis	5.4	11 30 39.110	3.072	− 0 8 40.54	19.84
β Leonis	3	11 42 47.104	3.065	+15 15 35.68	20.09
γ Ursæ Majoris . .	2.8	11 47 21.224	3.187	+54 22 42.95	20.02
ο Virginis	4	11 58 56.635	3.059	+ 9 24 59.12	20.00
* 4 Draconis (H.) . .	5.4	12 6 25.178	+ 2.901	+78 17 57.56	−20.05
* β Chamæleontis . .	5	12 11 9.345	3.852	−78 37 46.25	20.04
η Virginis	3.4	12 13 36.822	3.069	+ 0 1 1.56	20.03
α¹ Crucis	1	12 19 45.566	3.270	−62 24 57.69	19.92
β Corvi	2.3	12 27 55.711	3.139	−22 42 56.97	19.94
* κ Draconis	3.4	12 28 13.489	+ 2.599	+70 27 57.59	−19.92
* 32 Camelop. (H.) (*foll.*)	5.4	12 48 14.519	0.366	+84 4 51.74	19.63
12 Canum Venaticorum.	3	12 50 16.318	2.817	+38 58 59.34	19.50
θ Virginis	4.5	13 3 34.986	3.102	− 4 52 53.86	19.30
α Virginis (*Spica*) .	1	13 18 42.909	3.153	−10 31 6.40	18.91
ζ Virginis	3.4	13 28 25.602	+ 3.053	+ 0 2 2.22	−18.51
η Ursæ Majoris . .	2	13 42 41.603	2.374	+49 55 39.76	18.10
η Bootis	3	13 48 49.739	2.858	+19 0 55.23	18.16
β Centauri	1	13 55 9.407	4.168	−59 46 43.18	17.64
* α Draconis	3.4	14 1 3.626	+ 1.623	+64 57 48.89	−17.36

* Circumpolar Stars.

MEAN PLACES FOR 1877.0. (Jan. 0—$\overset{d}{.}$469, Washington.)

Star's Name.	Magnitude.	Right Ascension.			An. Variation.	Declination.			An. Variation.
		h	m	s	s	°	′	″	″
α Bootis (*Arcturus*)	1	14	10	3.082	+ 2.735	+19	49	26.84	−18.88
ϑ Bootis	4.3	14	21	0.530	+ 2.044	+52	25	12.12	16.77
* 5 Ursæ Minoris	5.4	14	27	48.365	− 0.205	+76	14	32.31	16 05
α^2 Centauri	1	14	31	16.503	+ 4.037	−60	19	24.71	15.01
ε Bootis	2.3	14	39	36.953	+ 2.622	+27	35	38.02	15.35
α^2 Libræ	2.3	14	44	4.550	+ 3.307	−15	31	44.87	−15.19
* β Ursæ Minoris	2	14	51	4.908	− 0.244	+74	39	27.84	14.75
β Bootis	3	14	57	18.768	+ 2.260	+40	52	35.84	14.39
β Libræ	2	15	10	23.376	+ 3.221	− 8	55	38.57	13.53
μ^1 Bootis	4.3	15	19	50.699	+ 2.267	+37	48	34.68	12.80
* γ^2 Ursæ Minoris	3	15	20	56.205	− 0.143	+72	16	18.53	−12.79
α Coronæ Borealis	2	15	29	28.833	+ 2.539	+27	7	48.05	12.32
α Serpentis	2.3	15	38	12.589	+ 2.951	+ 6	48	51.00	11.57
ε Serpentis	3.4	15	44	41.151	+ 2.987	+ 4	50	58.11	11.08
* ζ Ursæ Minoris	4.5	15	48	29.365	− 2.276	+78	10	19.11	10.89
ε Coronæ Borealis	4	15	52	29.840	+ 2.485	+27	14	8.08	−10.62
δ Scorpii	2.3	15	53	3.746	+ 3.537	−22	16	9.78	10.54
β^1 Scorpii	2	15	58	17.175	+ 3.478	−19	28	1.27	10.17
* Groombridge 2320	6.5	16	5	59.397	+ 0.135	+68	8	3.45	9.50
δ Ophiuchi	3	16	7	54.030	+ 3.138	− 3	22	32.67	9.55
τ Herculis	3.4	16	16	2.509	+ 1.798	+46	36	25.61	− 8.76
α Scorpii (*Antares*)	1.2	16	21	52.094	+ 3.669	−26	9	25.25	8.35
η Draconis	3.2	16	22	19.793	+ 0.805	+61	47	34.66	8.22
* A Draconis	5	16	28	13.961	− 0.140	+69	2	3.11	7.78
ζ Ophiuchi	3.2	16	30	23.217	+ 3.298	−10	18	57.11	7.60
* α Trianguli Australis	2	16	35	39.550	+ 6.289	−68	47	55.35	− 7.29
η Herculis	3	16	38	40.771	+ 2.055	+39	9	27.28	7.03
κ Ophiuchi	3.4	16	51	50.747	+ 2.835	+ 9	34	5.17	5.85
d Herculis	5	16	57	3.774	+ 2.209	+33	44	52.42	5.40
* ε Ursæ Minoris	4.5	16	58	38.161	− 6.370	+82	14	12.18	5.30
α^1 Herculis	var.	17	9	2.347	+ 2.734	+14	31	56.07	− 4.38
44 Ophiuchi	5	17	18	51.555	+ 3.659	−24	3	34.16	3.66
β Draconis	3.2	17	27	39.180	+ 1.351	+52	23	34.67	2.82
α Ophiuchi	2	17	29	13.483	+ 2.782	+12	39	4.74	2.90
* ω Draconis	5	17	37	40.410	− 0.355	+68	48	50.64	1.66
μ Herculis	3.4	17	41	38.702	+ 2.345	+27	47	39.01	− 2.33
* ψ^1 Draconis (*pr.*)	4.5	17	44	7.721	− 1.081	+72	12	31.51	1.65
γ Draconis	2.3	17	53	45.158	+ 1.393	+51	30	14.27	0.59
γ^2 Sagittarii	3.4	17	57	54 429	+ 3.853	−30	25	24.52	− 0.40
μ^1 Sagittarii	4	18	6	24.443	+ 3.586	−21	5	19.87	+ 0.57
* δ Ursæ Minoris	4.5	18	12	0.469	−19.428	+86	36	29.65	+ 1.09
η Serpentis	3	18	14	56.644	+ 3.100	− 2	55	43.32	0.64
* σ Octantis	6	18	19	1.388	+108.564	−89	16	35.10	1.66
1 Aquilæ (3 H. Scuti)	4.5	18	28	30.755	+ 3.264	− 8	19	40.93	2.18
α Lyræ (*Vega*)	1	18	32	46.433	+ 2.032	+38	40	12.92	3.15
β Lyræ	var.	18	45	32.312	+ 2.214	+33	13	15.68	+ 3.95
σ Sagittarii	2.3	18	47	38.286	+ 3.723	−26	26	49.73	4.08
* 50 Draconis	6	18	50	19.819	− 1.902	+75	17	15.35	4.42
ζ Aquilæ	3	18	59	45.314	+ 2.755	+13	40	56.30	5.08
d Sagittarii	5	19	10	26.232	+ 3.513	−19	10	8.39	+ 6.11

* Circumpolar Stars.

MEAN PLACES FOR 1877.0. (Jan. 0—^{d}.469, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		h m s	s	° ′ ″	″
* δ Draconis	3	19 12 31.338	+ 0.032	+67 26 41.99	+ 6.31
* τ Draconis	5	19 17 54.497	− 1.110	+73 7 34.94	6.78
δ Aquilæ	3.4	19 19 17.731	+ 3.024	+ 2 52 16.74	6.90
κ Aquilæ	5	19 30 16.383	+ 3.230	− 7 17 55.73	7.72
γ Aquilæ	3	19 40 24.703	+ 2.853	+10 18 54.07	8.52
α Aquilæ (*Altair*)	1.2	19 44 46.885	+ 2.928	+ 8 32 41.93	+ 9.23
* λ Ursæ Minoris	6.7	19 47 15.836	−61.248	+88 56 9.15	9.04
* ε Draconis	4	19 48 34.751	− 0.174	+69 57 15.27	9.14
β Aquilæ	4	19 49 16.244	+ 2.947	+ 6 6 3.95	8.73
τ Aquilæ	6.5	19 58 7.866	+ 2.934	+ 6 55 56.70	9.91
α^2 Capricorni	3.4	20 11 13.701	+ 3.332	−12 55 27.96	+10.88
* κ Cephei	4.5	20 12 59.831	− 1.903	+77 20 23.14	11.00
α Pavonis	2	20 15 54.740	+ 4.791	−57 7 35.50	11.18
π Capricorni	5	20 20 16.746	+ 3.441	−18 36 47.45	11.49
ε Delphini	4	20 27 20.153	+ 2.866	+10 53 11.60	12.01
* Groombridge 3241	6.7	20 30 31.468	− 0.212	+72 6 53.77	+12.22
α Cygni	2.1	20 37 14.324	+ 2.044	+44 50 29.57	12.71
μ Aquarii	5.4	20 46 1.056	+ 3.240	− 9 26 35.55	13.27
ν Cygni	4	20 52 35.250	+ 2.234	+40 41 41.28	13.73
* 12 Year Cat. 1879	6	20 53 6.547	− 2.512	+80 5 22.92	13.70
61 Cygni (*pr.*)	5.6	21 1 23.109	+ 2.688	+38 8 44.28	+17.52
ζ Cygni	3	21 7 42.079	2.550	+29 43 24.17	14.59
α Cephei	3.2	21 15 38.577	1.437	+62 3 51.78	15.11
1 Pegasi	4.5	21 16 23.958	2.774	+19 16 46.47	15.25
β Aquarii	3	21 25 4.982	3.164	− 6 6 39.39	15.66
* β Cephei	3	21 27 3.956	+ 0.798	+70 1 14.06	+15.71
ξ Aquarii	5.4	21 31 12.154	3.198	− 8 24 16.56	15.96
ε Pegasi	2.3	21 38 8.715	2.948	+ 9 18 43.71	16.35
* 11 Cephei	5	21 40 6.892	0.905	+70 44 42.05	16.51
μ Capricorni	5	21 46 35.331	3.279	−14 7 45.57	16.78
* 79 Draconis	6.7	21 51 20.121	+ 0.735	+73 7 13.15	+16.97
α Aquarii	3	21 59 27.947	3.084	− 0 54 59.32	17.34
α Gruis	2	22 0 28.436	3.811	−47 33 19.60	17.21
θ Aquarii	4.5	22 10 20.531	3.170	− 8 23 41.49	17.80
π Aquarii	5.4	22 18 59.700	3.066	+ 0 45 14.38	18.14
η Aquarii	4.3	22 29 2.103	+ 3.083	− 0 45 2.63	+18.45
*226 Cephei (B.)	5.6	22 30 6.506	1.081	+75 35 32.94	18.52
ζ Pegasi	3.4	22 35 19.591	2.988	+10 11 24.38	18.71
* ι Cephei	4.3	22 45 18.235	2.119	+65 33 13.04	18.86
λ Aquarii	4	22 46 11.740	3.131	− 8 13 59.96	19.07
α Pis.Aus.(*Fomalhaut*)	1.2	22 50 51.034	+ 3.328	−30 16 24.23	+18.99
α Pegasi (*Markab*)	2	22 58 38.073	2.984	+14 32 38.93	19.32
* ο Cephei	6.5	23 13 34.926	2.439	+67 26 17.90	19.62
θ Piscium	4.5	23 21 43.703	3.041	+ 5 42 14.17	19.75
ι Piscium	4.5	23 33 37.497	3.085	+ 4 57 35.85	19.48
* γ Cephei	3.4	23 34 18.622	+ 2.406	+76 56 45.30	+20.08
* Groombridge 4163	7	23 48 52.033	2.854	+73 43 32.28	20.00
ω Piscium	4	23 52 59.753	+ 3.078	+ 6 10 57.22	+19.95

*Circumpolar Stars.

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 13	° ′ +88 39		h m 1 12	° ′ +88 39		h m 1 12	° ′ +88 39		h m 1 12	° ′ +88 39
	s	″		s	″		s	″		s	″
0.3	30.85	36.6	1.2	61.87	36.9	1.1	41.56	32.0	1.0	32.17	23.1
1.3	29.90	36.8	2.2	61.00	36.8	2.1	41.02	31.7	2.0	32.24	22.8
2.3	28.91	36.9	3.2	60.19	36.6	3.1	40.54	31.5	3.0	32.31	22.5
3.3	27.92	37.0	4.2	59.42	36.5	4.1	40.11	31.2	4.0	32.35	22.2
4.3	26.95	37.1	5.2	58.69	36.3	5.1	39.71	30.9	5.0	32.37	21.9
5.3	26.01	37.1	6.2	57.98	36.2	6.1	39.31	30.6	6.0	32.36	21.6
6.2	25.11	37.2	7.2	57.26	36.1	7.1	38.91	30.4	7.0	32.33	21.4
7.2	24.25	37.2	8.2	56.51	36.0	8.1	38.49	30.2	8.0	32.28	21.1
8.2	23.43	37.3	9.2	55.72	35.9	9.1	38.03	29.9	9.0	32.25	20.8
9.2	22.63	37.3	10.2	54.90	35.8	10.1	37.54	29.7	10.0	32.26	20.4
10.2	21.83	37.4	11.2	54.05	35.7	11.1	37.04	29.4	11.0	32.33	20.1
11.2	21.01	37.4	12.2	53.16	35.5	12.1	36.52	29.1	12.0	32.46	19.7
12.2	20.15	37.5	13.1	52.28	35.3	13.1	36.02	28.9	13.0	32.66	19.4
13.2	19.23	37.5	14.1	51.44	35.1	14.1	35.57	28.5	14.0	32.92	19.1
14.2	18.27	37.6	15.1	50.64	34.9	15.1	35.19	28.2	15.0	33.22	18.8
15.2	17.27	37.6	16.1	49.89	34.7	16.1	34.88	27.9	16.0	33.54	18.5
16.2	16.25	37.6	17.1	49.20	34.5	17.1	34.64	27.6	17.0	33.85	18.2
17.2	15.23	37.6	18.1	48.58	34.3	18.1	34.45	27.3	18.0	34.13	18.0
18.2	14.24	37.6	19.1	48.00	34.1	19.1	34.28	27.0	19.0	34.39	17.7
19.2	13.28	37.5	20.1	47.43	33.9	20.1	34.12	26.7	20.0	34.61	17.5
20.2	12.38	37.5	21.1	46.85	33.7	21.0	33.94	26.4	21.0	34.81	17.2
21.2	11.53	37.4	22.1	46.25	33.5	22.0	33.74	26.2	22.0	35.01	16.9
22.2	10.73	37.4	23.1	45.62	33.4	23.0	33.51	25.9	23.0	35.23	16.6
23.2	9.95	37.4	24.1	44.95	33.2	24.0	33.25	25.6	24.0	35.49	16.3
24.2	9.17	37.3	25.1	44.25	33.0	25.0	32.98	25.4	25.0	35.81	16.0
25.2	8.37	37.3	26.1	43.53	32.8	26.0	32.72	25.1	25.9	36.19	15.7
26.2	7.52	37.3	27.1	42.82	32.5	27.0	32.48	24.7	26.9	36.64	15.4
27.2	6.63	37.3	28.1	42.16	32.3	28.0	32.29	24.4	27.9	37.14	15.1
28.2	5.70	37.2	29.1	41.56	32.0	29.0	32.17	24.1	28.9	37.66	14.8
29.2	4.73	37.2	30.1	41.02	31.7	30.0	32.12	23.7	29.9	38.19	14.6
30.2	3.76	37.1	31.1	40.54	31.5	31.0	32.13	23.4	30.9	38.70	14.4
31.2	2.80	37.0	32.1	40.11	31.2	32.0	32.17	23.1	31.9	39.18	14.1

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 12	+88° 39′		h m 1 12	+88° 39′		h m 1 13	+88° 39′		h m 1 13	+88° 39′
	s	″		s	″		s	″		s	″
1.9	39.18	14.1	1.8	59.41	8.1	1.8	26.26	6.7	1.7	55.11	10.3
2.9	39.62	13.9	2.8	60.12	8.0	2.8	27.19	6.7	2.7	56.09	10.5
3.9	40.04	13.7	3.8	60.87	7.8	3.8	28.17	6.7	3.7	57.06	10.8
4.9	40.44	13.5	4.8	61.66	7.7	4.8	29.20	6.7	4.7	57.99	11.0
5.9	40.84	13.2	5.8	62.51	7.6	5.8	30.26	6.8	5.7	58.87	11.3
6.9	41.27	12.9	6.8	63.42	7.4	6.8	31.32	6.9	6.7	59.69	11.5
7.9	41.74	12.6	7.8	64.38	7.3	7.7	32.37	7.0	7.7	60.46	11.8
8.9	42.27	12.4	8.8	65.36	7.2	8.7	33.38	7.1	8.7	61.19	12.0
9.9	42.87	12.1	9.8	66.34	7.1	9.7	34.34	7.2	9.7	61.90	12.3
10.9	43.53	11.8	10.8	67.31	7.1	10.7	35.25	7.3	10.7	62.62	12.5
11.9	44.23	11.6	11.8	68.24	7.1	11.7	36.11	7.4	11.7	63.37	12.7
12.9	44.95	11.4	12.8	69.11	7.0	12.7	36.95	7.5	12.7	64.16	12.9
13.9	45.67	11.2	13.8	69.95	7.0	13.7	37.79	7.6	13.6	64.99	13.1
14.9	46.37	11.0	14.8	70.76	7.0	14.7	38.64	7.7	14.6	65.85	13.4
15.9	47.04	10.9	15.8	71.56	6.9	15.7	39.54	7.8	15.6	66.72	13.6
16.9	47.67	10.7	16.8	72.37	6.9	16.7	40.49	7.9	16.6	67.59	13.9
17.9	48.27	10.5	17.8	73.21	6.8	17.7	41.48	8.0	17.6	68.44	14.1
18.9	48.85	10.4	18.8	74.11	6.7	18.7	42.50	8.1	18.6	69.24	14.4
19.9	49.44	10.2	19.8	75.07	6.7	19.7	43.53	8.2	19.6	69.99	14.8
20.9	50.06	10.0	20.8	76.07	6.6	20.7	44.55	8.4	20.6	70.68	15.1
21.9	50.72	9.8	21.8	77.09	6.6	21.7	45.55	8.5	21.6	71.32	15.3
22.9	51.44	9.6	22.8	78.12	6.5	22.7	46.50	8.7	22.6	71.92	15.6
23.9	52.21	9.4	23.8	79.14	6.6	23.7	47.40	8.9	23.6	72.50	15.9
24.9	53.04	9.2	24.8	80.14	6.6	24.7	48.25	9.1	24.6	73.10	16.2
25.9	53.90	9.0	25.8	81.10	6.6	25.7	49.06	9.2	25.6	73.73	16.4
26.9	54.77	8.8	26.8	82.01	6.6	26.7	49.85	9.4	26.6	74.40	16.7
27.9	55.63	8.7	27.8	82.87	6.7	27.7	50.64	9.6	27.6	75.12	17.0
28.9	56.46	8.6	28.8	83.71	6.7	28.7	51.45	9.7	28.6	75 87	17.3
29.9	57.25	8.5	29.8	84.54	6.7	29.7	52.30	9.9	29.6	76.63	17.6
30.9	58.00	8.4	30.8	85.38	6.7	30.7	53.20	10.0	30.6	77.38	17.9
31.9	58.71	8.3	31.8	86.26	6.7	31.7	54.14	10.2	31.6	78.10	18.2
32.8	59.41	8.1	32.8	87.19	6.7	32.7	55.11	10.3	32.6	78.77	18.6

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 14	° ′ +88 39		h m 1 14	° ′ +88 39		h m 1 14	° ′ +88 39		h m 1 13	° ′ +88 39
	s	″		s	″		s	″		s	″
1.6	18.77	18.6	1.5	31.86	29.4	1.4	32.50	41.3	1.3	80.39	51.1
2.6	19.36	18.9	2.5	32.01	29.8	2.4	32.28	41.5	2.3	79.87	51.4
3.6	19.93	19.3	3.5	32.14	30.2	3.4	32.09	41.9	3.3	79.35	51.6
4.6	20.43	19.7	4.5	32.27	30.6	4.4	31.93	42.3	4.3	78.81	51.9
5.6	20.90	20.0	5.5	32.41	30.9	5.4	31.78	42.7	5.3	78.24	52.2
6.6	21.36	20.3	6.5	32.59	31.3	6.4	31.62	43.0	6.3	77.62	52.5
7.6	21.84	20.7	7.5	32.82	31.6	7.4	31.44	43.4	7.3	76.94	52.7
8.6	22.35	21.0	8.5	33.07	32.0	8.4	31.22	43.7	8.3	76.19	52.9
9.6	22.90	21.3	9.5	33.32	32.4	9.4	30.94	44.1	9.3	75.40	53.1
10.6	23.48	21.6	10.5	33.55	32.7	10.4	30.59	44.5	10.3	74.58	53.4
11.6	24.08	21.9	11.5	33.75	33.1	11.4	30.18	44.9	11.3	73.76	53.6
12.6	24.68	22.3	12.5	33.90	33.6	12.4	29.72	45.2	12.3	72.96	53.9
13.6	25.26	22.6	13.5	33.99	34.0	13.4	29.24	45.6	13.3	72.19	54.1
14.6	25.80	23.0	14.5	34.01	34.4	14.4	28.77	45.9	14.3	71.46	54.3
15.6	26.29	23.4	15.5	33.98	34.8	15.4	28.32	46.2	15.3	70.77	54.5
16.6	26.72	23.8	16.5	33.91	35.2	16.4	27.90	46.5	16.3	70.11	54.7
17.6	27.09	24.2	17.5	33.82	35.6	17.4	27.52	46.8	17.3	69.46	54.9
18.6	27.42	24.5	18.5	33.75	35.9	18.4	27.17	47.1	18.3	68.78	55.1
19.5	27.72	24.9	19.5	33.71	36.3	19.4	26.84	47.4	19.3	68.06	55.3
20.5	28.01	25.2	20.5	33.70	36.6	20.4	26.50	47.7	20.3	67.29	55.5
21.5	28.32	25.6	21.5	33.73	36.9	21.4	26.13	48.1	21.3	66.47	55.7
22.5	28.66	25.9	22.5	33.79	37.4	22.4	25.70	48.4	22.3	65.60	55.9
23.5	29.05	26.3	23.5	33.85	37.7	23.4	25.21	48.8	23.3	64.69	56.1
24.5	29.48	26.6	24.5	33.88	38.1	24.4	24.66	49.1	24.3	63.75	56.3
25.5	29.92	26.9	25.4	33.88	38.5	25.4	24.06	49.5	25.3	62.82	56.4
26.5	30.36	27.3	26.4	33.82	38.9	26.4	23.42	49.8	26.3	61.92	56.5
27.5	30.78	27.7	27.4	33.70	39.4	27.4	22.77	50.1	27.3	61.06	56.6
28.5	31.14	28.1	28.4	33.52	39.8	28.4	22.13	50.3	28.3	60.24	56.7
29.5	31.44	28.6	29.4	33.28	40.2	29.4	21.51	50.6	29.3	59.46	56.8
30.5	31.68	29.0	30.4	33.02	40.6	30.4	20.93	50.9	30.3	58.71	57.0
31.5	31.86	29.4	31.4	32.75	40.9	31.3	20.39	51.1	31.3	57.98	57.1
32.5	32.01	29.8	32.4	32.50	41.3	32.3	19.87	51.4	32.3	57.18	57.2

APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
	6 42	+87 14		6 42	+87 14		6 42	+87 14		6 42	+87 14
	s	″		s	″		s	″		s	″
0.5	48.37	4.5	1.4	47.18	14.5	1.3	39.41	20.9	1.2	26.76	23.0
1.5	48.52	4.9	2.4	46.95	14.8	2.3	39.00	21.1	2.2	26.36	23.0
2.5	48.62	5.2	3.4	46.72	15.1	3.3	38.59	21.2	3.2	25.98	22.9
3.5	48.69	5.6	4.4	46.49	15.3	4.3	38.19	21.3	4.2	25.61	22.9
4.5	48.74	5.9	5.4	46.27	15.5	5.3	37.81	21.4	5.2	25.25	22.8
5.5	48.76	6.2	6.4	46.07	15.8	6.3	37.46	21.5	6.2	24.88	22.8
6.5	48.76	6.5	7.4	45.88	16.0	7.3	37.12	21.6	7.2	24.48	22.8
7.5	48.77	6.8	8.4	45.69	16.3	8.3	36.78	21.7	8.2	24.06	22.8
8.5	48.79	7.1	9.4	45.50	16.5	9.3	36.43	21.9	9.2	23.63	22.7
9.5	48.82	7.4	10.4	45.30	16.8	10.3	36.07	22.0	10.2	23.19	22.7
10.5	48.86	7.7	11.4	45.07	17.1	11.3	35.69	22.2	11.2	22.74	22.6
11.5	48.91	8.0	12.4	44.82	17.4	12.3	35.28	22.3	12.2	22.30	22.5
12.5	48.96	8.3	13.4	44.53	17.7	13.3	34.83	22.4	13.2	21.87	22.4
13.5	49.00	8.6	14.4	44.21	17.9	14.3	34.36	22.5	14.2	21.46	22.3
14.5	49.02	9.0	15.4	43.87	18.2	15.3	33.89	22.6	15.2	21.07	22.1
15.5	49.01	9.3	16.4	43.53	18.4	16.3	33.43	22.7	16.2	20.71	22.0
16.4	48.96	9.7	17.4	43.19	18.6	17.3	32.96	22.7	17.2	20.36	21.9
17.4	48.88	10.0	18.4	42.86	18.8	18.3	32.55	22.8	18.2	20.02	21.7
18.4	48.78	10.4	19.4	42.55	18.9	19.3	32.16	22.8	19.2	19.68	21.6
19.4	48.66	10.7	20.4	42.27	19.1	20.3	31.79	22.8	20.2	19.35	21.5
20.4	48.53	11.0	21.4	42.01	19.3	21.3	31.43	22.8	21.2	19.01	21.3
21.4	48.41	11.3	22.3	41.75	19.5	22.3	31.07	22.9	22.2	18.65	21.2
22.4	48.31	11.5	23.3	41.49	19.7	23.3	30.70	22.9	23.2	18.27	21.1
23.4	48.22	11.8	24.3	41.22	19.9	24.3	30.32	23.0	24.2	17.87	21.0
24.4	48.16	12.1	25.3	40.91	20.1	25.3	29.92	23.1	25.2	17.46	20.8
25.4	48.11	12.3	26.3	40.57	20.3	26.3	29.50	23.1	26.2	17.06	20.6
26.4	48.05	12.6	27.3	40.20	20.5	27.3	29.05	23.2	27.2	16.67	20.5
27.4	47.98	13.0	28.3	39.81	20.7	28.3	28.58	23.2	28.2	16.31	20.3
28.4	47.89	13.3	29.3	39.41	20.9	29.3	28.11	23.2	29.2	15.98	20.1
29.4	47.76	13.6	30.3	39.00	21.1	30.3	27.64	23.1	30.2	15.67	19.9
30.4	47.59	13.9	31.3	38.59	21.2	31.2	27.19	23.1	31.2	15.39	19.6
31.4	47.40	14.2	32.3	38.19	21.3	32.2	26.76	23.0	32.2	15.12	19.4

APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 6 42	° ′ +87 14		h m 6 42	° ′ +87 14		h m 6 42	° ′ +87 13		h m 6 42	° ′ +87 13
	s	″		s	″		s	″		s	″
1.2	15.39	19.6	1.1	8.52	12.2	1.0	8.44	62.9	1.9	15.56	53.4
2.2	15.12	19.4	2.1	8.40	11.9	2.0	8.50	62.6	2.9	15.94	53.0
3.2	14.86	19.2	3.1	8.26	11.7	3.0	8.57	62.3	3.9	16.32	52.7
4.2	14.56	19.1	4.1	8.11	11.4	4.0	8.65	62.0	4.9	16.73	52.5
5.2	14.28	18.9	5.1	7.96	11.1	5.0	8.76	61.6	5.9	17.15	52.2
6.1	13.95	18.8	6.1	7.82	10.8	6.0	8.91	61.3	6.9	17.57	52.0
7.1	13.61	18.6	7.1	7.70	10.5	7.0	9.09	60.9	7.9	17.96	51.7
8.1	13.26	18.4	8.1	7.62	10.1	8.0	9.30	60.6	8.9	18.37	51.5
9.1	12.93	18.2	9.1	7.57	9.8	9.0	9.53	60.3	9.9	18.74	51.3
10.1	12.61	18.0	10.1	7.56	9.4	10.0	9.77	60.0	10.9	19.09	51.1
11.1	12.31	17.7	11.1	7.57	9.1	11.0	10.00	59.7	11.9	19.43	50.9
12.1	12.04	17.4	12.0	7.59	8.8	12.0	10.23	59.4	12.9	19.78	50.6
13.1	11.81	17.1	13.0	7.62	8.5	13.0	10.44	59.1	13.9	20.14	50.4
14.1	11.61	16.8	14.0	7.66	8.2	14.0	10.63	58.9	14.9	20.52	50.1
15.1	11.43	16.6	15.0	7.68	7.9	15.0	10.80	58.6	15.9	20.93	49.8
16.1	11.26	16.4	16.0	7.67	7.6	16.0	10.97	58.3	16.9	21.36	49.6
17.1	11.06	16.2	17.0	7.64	7.3	17.0	11.15	58.0	17.9	21.81	49.3
18.1	10.89	16.0	18.0	7.61	7.0	17.9	11.35	57.6	18.9	22.28	49.1
19.1	10.69	15.8	19.0	7.58	6.7	18.9	11.57	57.3	19.9	22.76	48.9
20.1	10.47	15.6	20.0	7.56	6.4	19.9	11.83	57.0	20.9	23.23	48.7
21.1	10.23	15.3	21.0	7.56	6.1	20.9	12.11	56.6	21.9	23.69	48.6
22.1	9.90	15.1	22.0	7.59	5.7	21.9	12.42	56.3	22.9	24.13	48.4
23.1	9.76	14.8	23.0	7.66	5.3	22.9	12.74	56.0	23.8	24.54	48.2
24.1	9.54	14.5	24.0	7.75	5.0	23.9	13.06	55.8	24.8	24.93	48.1
25.1	9.34	14.2	25.0	7.86	4.7	24.9	13.37	55.5	25.8	25.33	47.9
26.1	9.16	13.9	26.0	7.98	4.4	25.9	13.67	55.3	26.8	25.74	47.7
27.1	9.02	13.6	27.0	8.10	4.1	26.9	13.95	55.0	27.8	26.16	47.5
28.1	8.91	13.3	28.0	8.21	3.8	27.9	14.20	54.8	28.8	26.60	47.3
29.1	8.82	13.0	29.0	8.31	3.5	28.9	14.45	54.5	29.8	27.08	47.0
30.1	8.73	12.7	30.0	8.38	3.2	29.9	14.70	54.3	30.8	27.59	46.8
31.1	8.63	12.4	31.0	8.44	2.9	30.9	14.97	54.0	31.8	28.13	46.6
32.1	8.52	12.2	32.0	8.50	2.6	31.9	15.26	53.7	32.8	28.68	46.5

APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 6 42	° ′ +87 13		h m 6 42	° ′ +87 13		h m 6 43	° ′ +87 13		h m 6 43	° ′ +87 13
	s	″		s	″		s	″		s	″
1.8	28.68	46.5	1.7	44.47	43.5	1.7	0.98	45.0	1.6	14.00	50.5
2.8	29.22	46.3	2.7	45.03	43.5	2.7	1.43	45.1	2.6	14.33	50.7
3.8	29.75	46.2	3.7	45.56	43.5	3.7	1.88	[illegible]	3.6	14.67	50.9
4.8	30.27	46.0	4.7	46.07	43.6	4.6	2.34	45.3	4.6	15.04	51.1
5.8	30.78	45.9	5.7	46.58	43.6	5.6	2.82	45.4	5.6	15.41	51.4
6.8	31.26	45.8	6.7	47.08	43.5	6.6	3.32	45.5	6.6	15.78	51.6
7.8	31.71	45.7	7.7	47.58	43.5	7.6	3.84	45.6	7.6	16.14	51.9
8.8	32.17	45.6	8.7	48.10	43.5	8.6	4.37	45.7	8.6	16.48	52.2
9.8	32.63	45.4	9.7	48.64	43.4	9.6	4.90	45.9	9.5	16.79	42.5
10.8	33.10	45.3	10.7	49.21	43.4	10.6	5.41	46.1	10.5	17.07	52.8
11.8	33.60	45.1	11.7	49.79	43.4	11.6	5.90	46.3	11.5	17.32	53.1
12.8	34.12	45.0	12.7	50.38	43.4	12.6	6.36	46.5	12.5	17.54	53.4
13.8	34.66	44.8	13.7	50.98	43.4	13.6	6.79	46.7	13.5	17.74	53.7
14.8	35.22	44.7	14.7	51.56	43.5	14.6	7.20	40.9	14.5	17.95	54.0
15.8	35.79	44.6	15.7	52.11	43.6	15.6	7.59	47.1	15.5	18.17	54.2
16.8	36.35	44.5	16.7	52.64	43.6	16.6	7.97	47.3	16.5	18.40	54.5
17.8	36.90	44.4	17.7	53.14	43.7	17.6	8.36	47.4	17.5	18.65	54.7
18.8	37.44	44.4	18.7	53.62	43.8	18.6	8.77	47.6	18.5	18.91	55.0
19.8	37.95	44.3	19.7	54.09	43.8	19.6	9.20	47.7	19.5	19.18	55.2
20.8	38.44	44.3	20.7	54.57	43.9	20.6	9.65	47.9	20.5	19.45	55.5
21.8	38.92	44.2	21.7	55.06	43.9	21.6	10.12	48.1	21.5	19.71	55.9
22.8	39.39	44.1	22.7	55.58	43.9	22.6	10.59	48.3	22.5	19.95	56.2
23.8	39.87	44.0	23.7	56.12	44.0	23.6	11.06	48.5	23.5	20.16	56.6
24.8	40.38	43.9	24.7	56.69	44.0	24.6	11.51	48.7	24.5	20.33	56.9
25.7	40.92	43.8	25.7	57.28	44.1	25.6	11.93	49.0	25.5	20.46	57.2
26.7	41.49	43.7	26.7	57.86	44.2	26.6	12.33	49.3	26.5	20.57	57.6
27.7	42.08	43.7	27.7	58.43	44.3	27.6	12.70	49.5	27.5	20.67	57.9
28.7	42.68	43.6	28.7	58.99	44.4	28.6	13.04	49.8	28.5	20.77	58.1
29.7	43.29	43.6	29.7	59.53	44.5	29.6	13.36	50.0	29.5	20.88	58.4
30.7	43.89	43.6	30.7	60.04	44.7	30.6	13.68	50.2	30.5	21.00	58.7
31.7	44.47	43.5	31.7	60.52	44.8	31.6	14.00	50.5	31.5	21.13	59.0
32.7	45.03	43.5	32.7	60.98	45.0	32.6	14.33	50.7	32.5	21.27	59.3

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36
	s	″		s	″		s	″		s	″
1.0	35.07	18.8	1.9	38.34	8.6	1.8	46.06	2.9	1.7	56.94	2.1
2.0	35.05	18.4	2.9	38.59	8.3	2.8	46.44	2.8	2.7	57.26	2.2
3.0	35.05	18.0	3.9	38.83	8.1	3.8	46.79	2.7	3.7	57.58	2.3
4.0	35.07	17.6	4.9	39.06	7.8	4.8	47.13	2.6	4.7	57.89	2.4
5.0	35.11	17.3	5.9	39.28	7.6	5.8	47.45	2.5	5.7	58.21	2.6
6.0	35.16	16.9	6.9	39.49	7.4	6.8	47.77	2.5	6.7	58.53	2.6
7.0	35.21	16.6	7.9	39.70	7.2	7.8	48.06	2.4	7.7	58.86	2.7
8.0	35.27	16.3	8.9	39.92	7.0	8.8	48.40	2.3	8.7	59.21	2.7
9.0	35.32	16.0	9.9	40.14	6.7	9.8	48.73	2.2	9.7	59.57	2.7
9.9	35.36	15.7	10.9	40.38	6.4	10.8	49.07	2.1	10.7	59.94	2.8
10.9	35.40	15.4	11.9	40.64	6.2	11.8	49.42	2.0	11.7	60.30	3.0
11.9	35.44	15.1	12.9	40.91	5.9	12.8	49.79	1.9	12.7	60.66	3.1
12.9	35.48	14.8	13.9	41.20	5.6	13.8	50.18	1.8	13.7	61.00	3.3
13.9	35.53	14.4	14.9	41.51	5.4	14.8	50.58	1.7	14.7	61.32	3.5
14.9	35.60	14.1	15.9	41.83	5.2	15.8	50.97	1.7	15.7	61.61	3.7
15.9	35.70	13.7	16.9	42.14	5.0	16.8	51.35	1.7	16.7	61.88	3.8
16.9	35.82	13.4	17.8	42.45	4.9	17.8	51.71	1.7	17.7	62.15	4.0
17.9	35.96	13.0	18.8	42.75	4.7	18.8	52.06	1.7	18.7	62.41	4.2
18.9	36.11	12.7	19.8	43.03	4.6	19.8	52.39	1.7	19.7	62.68	4.3
19.9	36.27	12.4	20.8	43.30	4.4	20.8	52.71	1.8	20.7	62.95	4.5
20.9	36.43	12.1	21.8	43.57	4.3	21.8	53.03	1.8	21.7	63.24	4.6
21.9	36.58	11.8	22.8	43.84	4.1	22.8	53.35	1.7	22.7	63.54	4.7
22.9	36.71	11.6	23.8	44.12	3.9	23.8	53.67	1.7	23.7	63.85	4.9
23.9	36.83	11.3	24.8	44.40	3.7	24.7	54.01	1.7	24.7	64.16	5.1
24.9	36.95	11.0	25.8	44.70	3.5	25.7	54.37	1.7	25.7	64.46	5.3
25.9	37.08	10.7	26.8	45.02	3.3	26.7	54.74	1.7	26.7	64.75	5.5
26.9	37.21	10.4	27.8	45.36	3.1	27.7	55.11	1.7	27.7	65.04	5.8
27.9	37.35	10.1	28.8	45.72	3.0	28.7	55.49	1.7	28.7	65.31	6.0
28.9	37.50	9.8	29.8	46.08	2.9	29.7	55.87	1.8	29.6	65.55	6.3
29.9	37.66	9.5	30.8	46.44	2.8	30.7	56.24	1.9	30.6	65.77	6.5
30.9	37.88	9.1	31.8	46.79	2.7	31.7	56.60	2.0	31.6	65.98	6.7
31.9	38.10	8.8	32.8	47.13	2.6	32.7	56.94	2.1	32.6	66.20	7.0

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.
	h m 18 12	° ′ +86 36		h m 18 12	° ′ +86 36		h m 18 12	° ′ +86 36		h m 18 11	° ′ +86 36
	s	″		s	″		s	″		s	″
1.6	5.98	6.7	1.6	10.90	15.3	1.5	10.14	24.9	1.4	63.68	33.9
2.6	6.20	7.0	2.6	10.99	15.6	2.5	10.05	25.2	2.4	63.37	34.2
3.6	6.42	7.2	3.6	11.08	15.9	3.5	9.95	25.6	3.4	63.05	34.5
4.6	6.65	7.4	4.6	11.17	16.2	4.5	9.84	25.9	4.4	62.72	34.7
5.6	6.88	7.6	5.6	11.25	16.5	5.5	9.71	26.3	5.4	62.38	35.0
6.6	7.12	7.8	6.6	11.32	16.8	6.5	9.55	26.6	6.4	62.02	35.2
7.6	7.37	8.0	7.5	11.37	17.2	7.5	9.37	27.0	7.4	61.67	35.4
8.6	7.63	8.2	8.5	11.40	17.6	8.5	9.18	27.3	8.4	61.33	35.6
9.6	7.88	8.5	9.5	11.40	17.9	9.5	8.97	27.6	9.4	61.00	35.7
10.6	8.10	8.8	10.5	11.39	18.3	10.5	8.75	27.9	10.4	60.68	35.9
11.6	8.30	9.1	11.5	11.36	18.6	11.5	8.54	28.1	11.4	60.37	36.1
12.6	8.48	9.4	12.5	11.32	18.9	12.4	8.34	28.4	12.4	60.07	36.3
13.6	8.64	9.7	13.5	11.28	19.2	13.4	8.15	28.7	13.4	59.76	36.5
14.6	8.78	10.0	14.5	11.25	19.5	14.4	7.97	28.9	14.4	59.44	36.8
15.6	8.91	10.3	15.5	11.23	19.8	15.4	7.80	29.2	15.4	59.10	37.0
16.6	9.04	10.6	16.5	11.22	20.1	16.4	7.62	29.5	16.4	58.74	37.2
17.6	9.18	10.8	17.5	11.22	20.4	17.4	7.43	29.8	17.3	58.36	37.5
18.6	9.32	11.1	18.5	11.21	20.7	18.4	7.23	30.2	18.3	57.97	37.7
19.6	9.47	11.3	19.5	11.19	21.1	19.4	7.01	30.5	19.3	57.58	37.8
20.6	9.63	11.5	20.5	11.16	21.4	20.4	6.77	30.8	20.3	57.18	38.0
21.6	9.80	11.8	21.5	11.12	21.8	21.4	6.51	31.1	21.3	56.79	38.2
22.6	9.96	12.1	22.5	11.06	22.1	22.4	6.24	31.4	22.3	56.41	38.3
23.6	10.11	12.4	23.5	10.97	22.5	23.4	5.96	31.7	23.3	56.05	38.4
24.6	10.25	12.8	24.5	10.87	22.8	24.4	5.69	31.9	24.3	55.70	38.5
25.6	10.38	13.2	25.5	10.76	23.2	25.4	5.43	32.1	25.3	55.36	38.7
26.6	10.49	13.5	26.5	10.64	23.5	26.4	5.18	32.4	26.3	55.01	38.8
27.6	10.57	13.8	27.5	10.52	23.8	27.4	4.93	32.6	27.3	54.65	39.0
28.6	10.64	14.1	28.5	10.41	24.0	28.4	4.69	32.8	28.3	54.28	39.2
29.6	10.70	14.4	29.5	10.31	24.3	29.4	4.46	33.1	29.3	53.88	39.4
30.6	10.76	14.7	30.5	10.22	24.6	30.4	4.22	33.3	30.3	53.46	39.5
31.6	10.82	15.0	31.5	10.14	24.9	31.4	3.96	33.6	31.3	53.03	39.7
32.6	10.90	15.3	32.5	10.05	25.2	32.4	3.68	33.9	32.3	52.60	39.8

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.
	h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36		h m 18 11	° ′ +86 36
	s	″		s	″		s	″		s	″
1.3	52.60	39.8	1.2	39.74	41.4	1.1	26.95	38.2	1.1	17.73	31.1
2.3	52.16	39.9	2.2	39.29	41.3	2.1	26.61	38.0	2.1	17.51	30.9
3.3	51.72	40.0	3.2	38.85	41.2	3.1	26.27	37.9	3.1	17.29	30.6
4.3	51.28	40.1	4.2	38.43	41.2	4.1	25.92	37.7	4.1	17.07	30.4
5.3	50.86	40.2	5.2	38.03	41.1	5.1	25.56	37.6	5.0	16.84	30.1
6.3	50.46	40.3	6.2	37.63	41.1	6.1	25.19	37.4	6.0	16.61	29.8
7.3	50.07	40.3	7.2	37.22	41.1	7.1	24.82	37.2	7.0	16.39	29.5
8.3	49.68	40.4	8.2	36.81	41.0	8.1	24.44	37.1	8.0	16.17	29.2
9.3	49.29	40.5	9.2	36.39	41.0	9.1	24.06	36.9	9.0	15.97	28.8
10.3	48.89	40.6	10.2	35.95	41.0	10.1	23.69	36.6	10.0	15.80	28.5
11.3	48.49	40.7	11.2	35.50	40.9	11.1	23.34	36.4	11.0	15.66	28.1
12.3	48.08	40.9	12.2	35.05	40.9	12.1	23.01	36.1	12.0	15.53	27.8
13.3	47.64	41.0	13.2	34.60	40.8	13.1	22.69	35.8	13.0	15.41	27.5
14.3	47.18	41.1	14.2	34.15	40.7	14.1	22.39	35.6	14.0	15.30	27.1
15.3	46.72	41.1	15.2	33.71	40.6	15.1	22.10	35.3	15.0	15.19	26.8
16.3	46.26	41.2	16.2	33.29	40.4	16.1	21.82	35.1	16.0	15.07	26.6
17.3	45.81	41.2	17.2	32.89	40.3	17.1	21.55	34.9	17.0	14.94	26.3
18.3	45.37	41.3	18.2	32.51	40.2	18.1	21.27	34.7	18.0	14.81	26.0
19.3	44.94	41.2	19.2	32.14	40.1	19.1	20.98	34.5	19.0	14.67	25.7
20.3	44.53	41.2	20.2	31.77	40.0	20.1	20.67	34.3	20.0	14.52	25.4
21.3	44.13	41.2	21.2	31.39	39.9	21.1	20.36	34.0	21.0	14.38	25.0
22.3	43.74	41.2	22.2	31.00	39.8	22.1	20.04	33.8	22.0	14.25	24.7
23.3	43.35	41.3	23.2	30.60	39.7	23.1	19.72	33.5	23.0	14.15	24.3
24.2	42.96	41.3	24.2	30.18	39.6	24.1	19.41	33.2	24.0	14.06	23.9
25.2	42.53	41.4	25.2	29.75	39.5	25.1	19.11	32.9	25.0	14.03	23.5
26.2	42.09	41.4	26.2	29.32	39.3	26.1	18.83	32.6	26.0	14.00	23.2
27.2	41.62	41.4	27.2	28.89	39.2	27.1	18.58	32.3	27.0	13.98	22.8
28.2	41.15	41.5	28.2	28.47	39.0	28.1	18.35	32.0	28.0	13.96	22.5
29.2	40.67	41.5	29.2	28.06	38.8	29.1	18.14	31.7	29.0	13.94	22.2
30.2	40.20	41.4	30.2	27.67	38.6	30.1	17.94	31.4	30.0	13.91	21.9
31.2	39.74	41.4	31.1	27.30	38.4	31.1	17.73	31.1	31.0	13.88	21.7
32.2	39.29	41.3	32.1	26.95	38.2	32.1	17.51	30.9	32.0	13.85	21.3

APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
	19 45	+88 55		19 45	+88 55		19 45	+88 55		19 46	+88 55
	s	″		s	″		s	″		s	″
1.1	45.43	68.4	1.0	39.84	58.5	1.9	54.29	50.4	1.8	24.41	45.9
2.1	44.81	68.1	2.0	40.14	58.2	2.9	55.19	50.1	2.8	25.47	45.9
3.1	44.28	67.7	3.0	40.48	57.8	3.9	56.10	49.9	3.8	26.49	45.8
4.0	43.82	67.4	4.0	40.84	57.5	4.9	56.99	49.8	4.8	27.48	45.8
5.0	43.43	67.1	5.0	41.19	57.3	5.9	57.83	49.6	5.8	28.47	45.8
6.0	43.10	66.7	6.0	41.52	57.0	6.9	58.63	49.4	6.8	29.47	45.7
7.0	42.81	66.4	7.0	41.82	56.7	7.9	59.40	49.2	7.8	30.51	45.6
8.0	42.53	66.2	8.0	42.09	56.5	8.9	60.15	49.0	8.8	31.61	45.6
9.0	42.24	65.9	8.9	42.35	56.2	9.9	60.92	48.8	9.8	32.77	45.5
10.0	41.92	65.6	9.9	42.62	55.9	10.9	61.74	48.6	10.8	33.98	45.5
11.0	41.57	65.3	10.9	42.92	55.6	11.9	62.62	48.4	11.8	35.21	45.5
12.0	41.20	65.0	11.9	43.27	55.2	12.9	63.56	48.2	12.8	36.44	45.5
13.0	40.82	64.7	12.9	43.69	54.9	13.9	64.56	48.0	13.8	37.65	45.5
14.0	40.46	64.4	13.9	44.18	54.6	14.8	65.61	47.8	14.8	38.82	45.6
15.0	40.14	64.0	14.9	44.75	54.2	15.8	66.70	47.6	15.8	39.92	45.7
16.0	39.89	63.7	15.9	45.38	53.9	16.8	67.80	47.5	16.8	40.96	45.7
17.0	39.72	63.3	16.9	46.04	53.7	17.8	68.87	47.3	17.8	41.96	45.8
18.0	39.63	63.0	17.9	46.69	53.4	18.8	69.89	47.2	18.8	42.90	45.8
19.0	39.60	62.6	18.9	47.33	53.2	19.8	70.87	47.1	19.8	43.84	45.9
20.0	39.62	62.3	19.9	47.93	52.9	20.8	71.80	47.0	20.8	44.79	45.9
21.0	39.67	62.0	20.9	48.48	52.7	21.8	72.70	46.9	21.8	45.79	45.9
22.0	39.72	61.7	21.9	49.00	52.5	22.8	73.58	46.8	22.7	46.86	45.9
23.0	39.75	61.4	22.9	49.50	52.2	23.8	74.46	46.7	23.7	46.98	46.0
24.0	39.73	61.1	23.9	50.01	52.0	24.8	75.39	46.6	24.7	49.13	46.1
25.0	39.67	60.8	24.9	50.55	51.7	25.8	76.38	46.4	25.7	50.30	46.1
26.0	39.58	60.5	25.9	51.15	51.4	26.8	77.44	46.3	26.7	51.47	46.2
27.0	39.49	60.2	26.9	51.84	51.1	27.8	78.57	46.2	27.7	52.62	46.4
28.0	39.42	59.9	27.9	52.60	50.8	28.8	79.74	46.1	28.7	53.72	46.5
29.0	39.41	59.5	28.9	53.42	50.6	29.8	80.93	46.0	29.7	54.76	46.6
30.0	39.47	59.2	29.9	54.29	50.4	30.8	82.12	45.9	30.7	55.74	46.8
31.0	39.61	58.8	30.9	55.19	50.1	31.8	83.29	45.9	31.7	56.67	46.9
32.0	39.84	58.5	31.9	56.10	49.9	32.8	84.41	45.9	32.7	57.57	47.0

APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 19 46	° ′ +88 55		h m 19 47	° ′ +88 55		h m 19 47	° ′ +88 56		h m 19 47	° ′ +88 56
	s	″		s	″		s	″		s	″
1.7	56.67	46.9	1.6	22.33	53.0	1.6	32.93	2.1	1.5	26.16	12.6
2.7	57.57	47.0	2.6	22.95	53.2	2.6	33.12	2.4	2.5	25.67	13.0
3.7	58.46	47.2	3.6	23.60	53.5	3.5	33.29	2.8	3.5	25.10	13.4
4.7	59.38	47.3	4.6	24.28	53.7	4.5	33.42	3.1	4.5	24.45	13.7
5.7	60.34	47.4	5.6	24.97	54.0	5.5	33.49	3.5	5.5	23.74	14.1
6.7	61.35	47.5	6.6	25.65	54.3	6.5	33.49	3.8	6.5	22.99	14.4
7.7	62.39	47.6	7.6	26.29	54.6	7.5	33.41	4.2	7.5	22.22	14.7
8.7	63.46	47.7	8.6	26.85	54.9	8.5	33.26	4.6	8.5	21.47	15.0
9.7	64.54	47.9	9.6	27.33	55.2	9.5	33.05	5.0	9.4	20.76	15.3
10.7	65.60	48.1	10.6	27.73	55.5	10.5	32.80	5.3	10.4	20.09	15.6
11.7	66.61	48.3	11.6	28.07	55.8	11.5	32.55	5.6	11.4	19.46	15.8
12.7	67.55	48.5	12.6	28.36	56.2	12.5	32.33	5.9	12.4	18.86	16.1
13.7	68.41	48.7	13.6	28.63	56.5	13.5	32.14	6.2	13.4	18.25	16.4
14.7	69.21	48.9	14.6	28.91	56.7	14.5	32.00	6.5	14.4	17.61	16.8
15.7	69.96	49.1	15.6	29.23	57.0	15.5	31.89	6.9	15.4	16.93	17.1
16.7	70.67	49.3	16.6	29.59	57.3	16.5	31.79	7.2	16.4	16.19	17.5
17.7	71.38	49.5	17.6	29.98	57.6	17.5	31.68	7.5	17.4	15.38	17.8
18.7	72.11	49.7	18.6	30.39	57.8	18.5	31.53	7.9	18.4	14.51	18.1
19.7	72.89	49.9	19.6	30.81	58.1	19.5	31.32	8.3	19.4	13.59	18.4
20.7	73.73	50.0	20.6	31.22	58.5	20.5	31.04	8.7	20.4	12.64	18.7
21.7	74.60	50.2	21.6	31.58	58.8	21.5	30.68	9.1	21.4	11.68	19.0
22.7	75.48	50.5	22.6	31.87	59.2	22.5	30.26	9.4	22.4	10.75	19.2
23.7	76.36	50.7	23.6	32.09	59.6	23.5	29.81	9.8	23.4	9.87	19.5
24.7	77.23	50.9	24.6	32.24	59.9	24.5	29.34	10.1	24.4	9.03	19.7
25.7	78.05	51.2	25.6	32.34	60.3	25.5	28.87	10.4	25.4	8.22	20.0
26.7	78.79	51.5	26.6	32.40	60.6	26.5	28.43	10.7	26.4	7.42	20.3
27.7	79.46	51.8	27.6	32.46	60.9	27.5	28.02	11.0	27.4	6.61	20.5
28.7	80.08	52.0	28.6	32.53	61.2	28.5	27.65	11.3	28.4	5 76	20.8
29.6	80.65	52.3	29.6	32.63	61.5	29.5	37.30	11.6	29.4	4.85	21.1
30.6	81.20	52.5	30.6	32.76	61.8	30.5	26.95	11.9	30.4	3.87	21.4
31.6	81.75	52.8	31.6	32.93	62.1	31.5	26.58	12.3	31.4	2.82	21.7
32.6	82.33	53.0	32.6	33.12	62.4	32.5	26.16	12.6	32.4	1.71	22.0

APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 19 46	° ′ +88 56		h m 19 45	° ′ +88 56		h m 19 45	° ′ +88 56		h m 19 44	° ′ +88 56
	s	″		s	″		s	″		s	″
1.4	61.71	22.0	1.3	85.73	28.1	1.2	43.40	29.9	1.1	65.96	26.8
2.4	60.55	22.3	2.3	84.31	28.2	2.2	42.14	29.8	2.1	64.97	26.7
3.4	59.37	22.6	3.3	82.94	28.3	3.2	40.90	29.8	3.1	63.97	26.5
4.4	58.19	22.8	4.3	81.63	28.4	4.2	39.66	29.8	4.1	62.92	26.4
5.4	57.04	23.0	5.3	80.38	28.5	5.2	38.40	29.8	5.1	61.83	26.2
6.4	55.94	23.2	6.3	79.16	28.6	6.2	37.10	29.9	6.1	60.71	26.0
7.4	54.90	23.4	7.3	77.94	28.7	7.2	35.75	29.9	7.1	59.58	25.8
8.4	53.89	23.6	8.3	76.69	28.8	8.2	34.36	29.9	8.1	58.46	25.6
9.4	52.89	23.8	9.3	75.40	29.0	9.2	32.94	29.8	9.1	57.38	25.4
10.4	51.88	24.1	10.3	74.06	29.1	10.2	31.51	29.7	10.1	56.37	25.1
11.4	50.84	24.3	11.3	72.67	29.2	11.2	30.10	29.5	11.1	55.45	24.8
12.4	49.75	24.6	12.3	71.24	29.3	12.2	28.73	29.4	12.1	54.60	24.6
13.4	48.59	24.9	13.3	69.77	29.4	13.2	27.41	29.3	13.1	53.80	24.3
14.4	47.37	25.1	14.3	68.29	29.5	14.2	26.15	29.1	14.1	53.02	24.1
15.4	46.10	25.3	15.3	66.82	29.5	15.2	24.96	29.0	15.1	52.25	23.9
16.3	44.80	25.5	16.3	65.40	29.6	16.2	23.81	28.9	16.1	51.48	23.7
17.3	43.49	25.7	17.3	64.03	29.6	17.2	22.68	28.8	17.1	50.68	23.5
18.3	42.20	25.8	18.3	62.72	29.5	18.2	21.55	28.7	18.1	49.84	23.2
19.3	40.95	26.0	19.3	61.45	29.6	19.2	20.39	28.6	19.1	48.95	23.0
20.3	39.75	26.2	20.2	60.20	29.7	20.2	19.17	28.5	20.1	48.03	22.8
21.3	38.60	26.3	21.2	58.95	29.7	21.2	17.90	28.4	21.1	47.12	22.5
22.3	37.47	26.5	22.2	57.68	29.8	22.2	16.59	28.3	22.1	46.23	22.3
23.3	36.35	26.7	23.2	25.36	29.8	23.2	15.25	28.2	23.1	45.39	22.0
24.3	35.22	26.9	24.2	54.97	29.9	24.2	13.91	28.1	24.1	44.62	21.6
25.3	34.04	27.1	25.2	53.53	30.0	25.2	12.59	27.9	25.1	43.93	21.3
26.3	32.79	27.3	26.2	52.04	30.0	26.2	11.33	27.7	26.1	43.33	21.0
27.3	31.46	27.5	27.2	50.52	30.0	27.1	10.14	27.6	27.1	42.79	20.7
28.3	30.06	27.7	28.2	49.00	30.0	28.1	9.02	27.4	28.1	42.28	20.5
29.3	28.63	27.8	29.2	47.51	30.0	29.1	7.96	27.2	29.1	41.78	20.2
30.3	27.18	28.0	30.2	46.08	29.9	30.1	6.95	27.0	30.1	41.28	19.9
31.3	25.73	28.1	31.2	44.71	29.9	31.1	5.96	26.8	31.1	40.75	19.7
32.3	24.31	28.2	32.2	43.40	29.9	32.1	4.97	26.7	32.1	40.18	19.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (*Algenib.*)		*β Hydri.		α Cassiopeæ	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 0 2	° ′ +28 24	h m 0 6	° ′ +14 29	h m 0 19	° ′ −77 56	h m 0 33	° ′ +55 51
	s	″	s	″	s	″	s	″
(Dec. 30.3)	1.70 −.13	52.0 −0.8	54.19 −.11	65.6 −0.7	17.75 −.93	70.2 +0.8	31.75 −.27	64.0 −0.1
Jan. 9.2	1.57 .13	51.1 1.0	54.08 .10	64.9 0.8	16.85 .88	69.1 1.4	31.48 .27	63.6 0.6
19.2	1.45 .12	50.0 1.2	53.98 .10	64.0 0.9	16.00 .81	67.4 2.0	31.21 .27	62.7 1.1
29.2	1.34 .10	48.6 1.4	53.89 .08	63.0 1.0	15.24 .72	65.1 2.5	30.95 .25	61.4 1.6
Feb. 8.1	1.25 .08	47.1 1.5	53.82 .07	62.0 1.0	14.58 .60	62.4 2.9	30.72 .22	59.6 1.9
18.1	1.18 .05	45.6 1.6	53.77 .04	61.1 0.9	14.04 .47	59.3 3.3	30.53 .17	57.5 2.2
28.1	1.15 −.02	44.0 1.5	53.74 −.01	60.3 0.8	13.63 .33	55.9 3.6	30.38 .12	55.2 2.4
Mar. 10.0	1.15 +.02	42.5 1.4	53.75 +.02	59.5 0.7	13.38 .18	52.2 3.8	30.30 −.05	52.8 2.5
20.0	1.20 .07	41.2 1.3	53.79 .06	58.9 0.5	13.28 −.03	48.3 3.9	30.28 +.02	50.3 2.5
30.0	1.29 .11	40.0 1.0	53.87 .10	58.6 −0.2	13.33 +.13	44.4 3.9	30.33 .09	47.9 2.3
Apr. 9.0	1.42 .16	39.2 0.7	53.99 .14	58.5 +0.1	13.54 .29	40.6 3.9	30.46 .17	45.6 2.1
19.0	1.60 .20	38.7 −0.3	54.15 .19	58.8 0.4	13.91 .45	36.8 3.7	30.66 .24	43.7 1.8
28.9	1.83 .25	38.5 +0.1	54.36 .22	59.3 0.7	14.43 .59	33.2 3.5	30.93 .31	42.1 1.4
May 8.9	2.09 .28	38.8 0.5	54.60 .26	60.2 1.0	15.09 .73	29.8 3.2	31.27 .36	40.9 1.0
18.9	2.39 .31	39.4 0.8	54.87 .29	61.4 1.3	15.88 .85	26.8 2.9	31.66 .42	40.1 −0.5
28.8	2.71 .34	40.4 1.2	55.17 .31	62.8 1.6	16.79 .95	24.1 2.5	32.09 .46	39.9 0.0
June 7.8	3.06 .35	41.8 1.6	55.49 .33	64.6 1.8	17.78 1.03	21.9 2.0	32.56 .48	40.1 +0.5
17.8	3.41 .36	43.5 1.9	55.82 .33	66.5 2.0	18.84 1.09	20.2 1.5	33.05 .50	40.9 1.0
27.7	3.76 .35	45.5 2.1	56.15 .33	68.6 2.1	19.94 1.12	19.0 0.9	33.55 .50	42.1 1.5
July 7.7	4.11 .34	47.7 2.3	56.48 .32	70.7 2.2	21.05 1.11	18.4 +0.3	34.05 .49	43.8 1.9
17.7	4.44 .32	50.1 2.5	56.79 .30	72.9 2.2	22.14 1.07	18.3 −0.3	34.52 .46	45.9 2.3
27.7	4.74 .29	52.6 2.6	57.08 .28	75.2 2.2	23.19 1.01	18.8 0.8	34.97 .43	48.3 2.6
Aug. 6.6	5.02 .26	55.2 2.6	57.34 .25	77.3 2.1	24.15 .91	19.9 1.3	35.37 .39	51.0 2.9
16.6	5.25 .22	57.8 2.5	57.57 .21	79.4 2.0	24.99 .78	21.5 1.8	35.74 .34	54.0 3.1
26.6	5.45 .18	60.3 2.5	57.76 .18	81.3 1.8	25.71 .64	23.6 2.3	36.05 .29	57.1 3.2
Sept. 5.6	5.61 .14	62.7 2.4	57.92 .14	83.0 1.7	26.26 .47	26.0 2.6	36.31 .23	60.4 3.3
15.5	5.73 .10	65.0 2.2	58.04 .10	84.6 1.5	26.63 .28	28.8 2.9	36.52 .18	63.7 3.3
25.5	5.80 .06	67.1 2.0	58.12 .06	85.9 1.2	26.82 +.09	31.7 3.0	36.66 .12	66.9 3.2
Oct. 5.5	5.84 +.02	69.0 1.8	58.16 +.03	87.1 1.0	26.82 −.10	34.7 3.0	36.75 .06	70.1 3.1
15.4	5.85 −.01	70.7 1.5	58.17 .00	87.9 0.8	26.62 .29	37.7 2.9	36.79 +.01	73.2 3.0
25.4	5.82 .04	72.1 1.3	58.16 −.03	88.6 0.5	26.24 .47	40.5 2.7	36.77 −.05	76.0 2.7
Nov. 4.4	5.76 .07	73.2 1.0	58.12 .05	89.0 0.3	25.70 .69	43.1 2.4	36.70 .09	78.6 2.4
14.4	5.69 .09	74.1 0.7	58.06 .07	89.2 +0.1	25.01 .75	45.2 1.9	36.58 .14	80.9 2.1
24.3	5.59 .11	74.6 0.4	57.98 .09	89.2 −0.1	24.22 .85	46.9 1.4	36.42 .18	82.7 1.6
Dec. 4.3	5.48 .12	74.9 +0.1	57.88 .10	89.0 0.3	23.33 .91	48.0 0.8	36.23 .21	84.2 1.2
14.3	5.35 .13	74.7 −0.3	57.78 .10	88.7 0.5	22.40 .95	48.5 −0.2	36.00 .24	85.1 0.7
24.3	5.22 .13	74.3 0.6	57.68 .11	88.1 0.6	21.45 .95	48.4 +0.4	35.75 .26	85.6 +0.2
34.2	5.10 −.13	73.6 −0.9	57.57 −.11	87.4 −0.8	20.51 −.92	47.7 +1.0	35.49 −.27	85.5 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ceti.		*21 Cassiopeæ.		ε Piscium.		θ¹ Ceti.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 0 37	° ′ −18 39	h m 0 37	° ′ +74 18	h m 0 56	° ′ +7 13	h m 1 17	° ′ −8 48
	s	″	s	″	s	″	s	″
(Dec. 30.3)	25.33 −.12	47.4 −0.5	31.69 −.68	75.8 +0.3	34.01 −.10	44.6 −0.6	53.16 −.11	65.3 −0.8
Jan. 9.2	25.21 .11	47.8 −0.3	31.00 .69	75.8 −0.3	33.91 .11	43.9 0.6	53.05 .11	66.0 0.6
19.2	25.10 .11	48.0 0.0	30.32 .67	75.2 0.9	33.80 .11	43.3 0.7	52.94 .12	66.5 0.4
29.2	24.99 .10	47.9 +0.2	29.67 .63	74.1 1.4	33.69 .11	42.7 0.6	52.82 .12	66.8 −0.2
Feb. 8.1	24.90 .09	47.5 0.5	29.08 .55	72.4 2.0	33.59 .09	42.0 0.6	52.71 .11	66.9 0.0
18.1	24.82 .07	46.9 0.8	28.57 .46	70.2 2.4	33.50 .08	41.5 0.5	52.61 .09	66.8 +0.2
28.1	24.76 .04	46.0 1.0	28.17 .33	67.7 2.7	33.44 .05	41.1 0.4	52.52 .07	66.5 0.4
Mar. 10.1	24.74 −.01	44.9 1.3	27.91 .20	64.9 2.9	33.40 −.03	40.8 −0.2	52.46 .05	66.0 0.7
20.0	24.75 +.03	43.4 1.5	27.78 −.05	62.0 2.9	33.39 +.01	40.7 0.0	52.43 −.01	65.2 0.9
30.0	24.79 .07	41.8 1.8	27.81 +.11	59.1 2.9	33.42 .05	40.8 +0.2	52.44 +.02	64.1 1.2
Apr. 9.0	24.88 .11	39.9 2.0	27.99 .26	56.3 2.7	33.49 .09	41.1 0.5	52.48 .06	62.9 1.4
19.0	25.00 .15	37.8 2.2	28.32 .40	53.7 2.5	33.60 .13	41.7 0.7	52.57 .11	61.4 1.6
28.9	25.17 .19	35.6 2.3	28.80 .54	51.4 2.1	33.76 .18	42.5 1.0	52.69 .15	59.6 1.8
May 8.9	25.38 .23	33.2 2.4	29.40 .66	49.5 1.7	33.95 .22	43.6 1.2	52.86 .19	57.7 2.0
18.9	25.63 .26	30.8 2.4	30.11 .76	48.1 1.2	34.19 .25	45.0 1.5	53.08 .23	55.7 2.1
28.8	25.91 .29	28.4 2.4	30.90 .83	47.2 0.6	34.46 .28	46.6 1.7	53.33 .26	53.5 2.2
June 7.8	26.21 .31	26.0 2.4	31.76 .88	46.8 −0.1	34.75 .30	48.3 1.8	53.60 .29	51.3 2.2
17.8	26.53 .33	23.7 2.2	32.66 .91	47.0 +0.5	35.06 .32	50.2 1.9	53.90 .31	49.1 2.2
27.8	26.86 .33	21.5 2.1	33.57 .91	47.8 1.0	35.39 .33	52.2 2.0	54.21 .32	46.9 2.1
July 7.7	27.19 .33	19.6 1.8	34.47 .89	49.0 1.5	35.71 .32	54.2 2.1	54.54 .32	44.8 2.0
17.7	27.52 .32	17.9 1.5	35.35 .85	50.8 2.0	36.03 .31	56.3 2.0	54.86 .32	42.9 1.8
27.7	27.83 .30	16.5 1.2	36.17 .79	53.0 2.4	36.34 .30	58.2 1.9	55.17 .31	41.2 1.6
Aug. 6.7	28.11 .27	15.5 0.9	36.92 .72	55.6 2.8	36.62 .27	60.1 1.8	55.46 .29	39.8 1.3
16.6	28.37 .24	14.8 0.5	37.60 .63	58.6 3.1	36.88 .25	61.8 1.6	55.74 .26	38.6 1.0
26.6	28.60 .21	14.4 +0.2	38.18 .53	61.9 3.4	37.12 .22	63.3 1.4	55.98 .23	37.7 0.7
Sept. 5.6	28.79 .17	14.4 −0.2	38.65 .42	65.4 3.6	37.32 .18	64.7 1.2	56.20 .20	37.2 0.4
15.5	28.94 .13	14.8 0.5	39.02 .31	69.0 3.7	37.48 .15	65.8 1.0	56.38 .17	36.9 +0.1
25.5	29.05 .09	15.4 0.8	39.27 .19	72.7 3.7	37.61 .11	66.6 0.7	56.53 .13	37.0 −0.2
Oct. 5.5	29.12 .05	16.3 1.0	39.41 +.06	76.4 3.7	37.71 .08	67.2 0.5	56.64 .10	37.4 0.5
15.5	29.15 +.02	17.4 1.2	39.43 −.04	80.1 3.6	37.77 .05	67.7 0.3	56.72 .06	38.0 0.7
25.4	29.16 −.01	18.6 1.3	39.33 .16	83.6 3.4	37.80 +.02	67.9 +0.1	56.77 +.03	38.7 0.9
Nov. 4.4	29.13 .04	19.9 1.3	39.11 .27	86.8 3.1	37.81 −.01	67.9 −0.1	56.79 .00	39.7 1.0
14.4	29.07 .07	21.2 1.3	38.79 .37	89.8 2.8	37.79 .03	67.8 0.2	56.78 −.02	40.7 1.0
24.3	29.00 .08	22.5 1.2	38.37 .47	92.3 2.4	37.74 .05	67.5 0.3	56.74 .05	41.7 1.1
Dec. 4.3	28.91 .10	23.6 1.1	37.87 .55	94.5 1.9	37.68 .07	67.1 0.5	56.69 .07	42.7 1.0
14.3	28.80 .11	24.6 0.9	37.28 .61	96.0 1.3	37.60 .09	66.6 0.5	56.61 .08	43.7 1.0
24.3	28.69 .12	25.4 0.7	36.64 .66	97.0 0.7	37.51 .10	66.1 0.6	56.52 .10	44.6 0.8
34.2	28.57 −.12	26.0 −0.5	35.97 −.68	97.4 +0.1	37.41 −.11	65.5 −0.6	56.41 −.11	45.4 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*38 Cassiopeæ.		η Piscium.		α Eridani. (*Achernar.*)		ο Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 1 22	° ′ +69 37	h m 1 24	° ′ +14 42	h m 1 33	° ′ −57 51	h m 1 38	° ′ +8 32
	s	″	s	″	s	″	s	″
(Dec. 30.3)	5.96 −.46	73.3 +0.8	54.61 −.10	49.8 −0.5	9.33 −.32	55.0 −0.7	54.66 −.09	23.7 −0.6
Jan. 9.3	5.46 .50	73.8 +0.2	54.50 .11	49.3 0.6	9.00 .33	55.3 −0.1	54.56 .11	23.1 0.6
19.2	4.97 .51	73.8 −0.4	54.38 .12	48.7 0.7	8.68 .33	55.1 +0 5	54.45 .12	22.6 0.6
29.2	4.47 .50	73.1 0.9	54.26 .12	48.0 0.7	8.35 .32	54.4 1.0	54.33 .12	22.0 0 6
Feb. 8.2	3.98 .47	71.9 1.5	54.14 .12	47.3 0.7	8.04 .30	53.1 1.6	54.21 .12	21.4 0.6
18.1	3.54 .41	70.2 1.9	54.03 .10	46.5 0.7	7.76 .27	51.2 2.0	54.10 .11	20.9 0.5
28.1	3.17 .34	68.1 2.3	53.94 .08	45.8 0.7	7.51 .23	49.0 2.5	54.00 .09	20.4 0.4
Mar. 10.1	2.88 .24	65.7 2.6	53.88 .05	45.2 0.6	7.30 .16	46.3 2.8	53.92 .06	20.1 0.2
20.1	2.69 .14	63.0 2.7	53.84 −.02	44.7 0.4	7.14 .13	43.3 3.1	53.88 −.03	20.0 −0.1
30.0	2.61 −.02	60.3 2.8	53.84 +.02	44.3 −0.3	7.05 −.07	40.1 3.4	53.86 +.01	20.0 +0.1
Apr. 9.0	2.65 +.10	57.6 2.7	53.89 .07	44.2 0.0	7.01 .00	36 6 3.5	53.89 .05	20.2 0.3
19.0	2.81 .22	55.0 2.5	53.98 .11	44.3 +0.2	7.05 +.07	33.0 3.6	53.97 .09	20.6 0.6
29.0	3.09 .34	52.6 2.2	54.11 .16	44.6 0.5	7.16 .14	29.4 3.7	54.08 .14	21.3 0.8
May 8.9	3.49 .45	50 5 1.9	54.29 .20	45.2 0.8	7.33 .21	25.7 3.6	54.24 .18	22.2 1.1
18.9	3.99 .54	48.8 1.5	54.51 .24	46.1 1.0	7.58 .28	22.2 3.5	54.45 .22	23.4 1.3
28.9	4.57 .62	47.6 1.0	54.76 .27	47.2 1.3	7.88 .34	18.9 3.2	54.69 .26	24.8 1.5
June 7.8	5.22 .68	46.8 −0.5	55.05 .30	48.6 1.5	8.25 .39	15.8 2.9	54.96 .29	26.4 1.7
17.8	5.92 .72	46.5 0.0	55.36 .32	50.2 1.7	8.66 .43	13.0 2.6	55.25 .31	28.1 1.8
27.8	6.66 .75	46.8 +0.5	55.69 .33	52.0 1.8	9.10 .46	10.7 2.1	55.57 .32	29.9 1.9
July 7.8	7.40 .75	47.6 1.0	56.02 .33	53.8 1.9	9.58 .48	8.8 1.6	55.89 .33	31.8 1.9
17.7	8.15 .74	48.8 1.5	56.34 .33	55.8 2.0	10.06 .48	7.4 1.1	56.22 .32	33.7 1.9
27.7	8.87 .71	50 5 1.9	56.67 .32	57.7 2 0	10.54 48	6.6 +0.6	56.53 .31	35 6 1.9
Aug. 6.7	9.56 .66	52.7 2.3	56.97 .30	59.7 1.9	11.00 .46	6.3 0.0	56.84 .30	37.4 1.8
16.6	10.20 .61	55.2 2.7	57.26 .27	61.5 1.8	11.44 .42	6.6 −0.6	57.12 .27	39.1 1.6
26.6	10.77 .54	58.0 3.0	57.51 .24	63.3 1.7	11.85 .38	7.5 1.1	57.39 .25	40.6 1.4
Sept. 5.6	11.28 .47	61.1 3.2	57.74 .21	64.9 1.5	12.20 .32	8.9 1.6	57.62 .22	41.9 1.2
15.6	11.71 .39	64.4 3.4	57.93 .18	66.3 1 3	12.49 .26	10.7 2.1	57.82 .19	43.0 1.0
25.5	12.06 .31	67.8 3.5	58 10 .15	67.5 1.2	12 72 .19	13.0 2.4	57.99 .16	43.9 0.8
Oct. 5.5	12.32 .22	71.3 3.5	58.23 .11	68.6 0.9	12.87 .12	15.6 2.7	58.13 .12	44.5 0.5
15.5	12.50 .13	74.8 3.5	58.32 .08	69.4 0.7	12.96 +.05	18.4 2.9	58.24 .09	45.0 0.3
25.5	12.58 +.04	78.2 3.4	58.38 .05	70.1 0.5	12.98 −.02	21.3 2.9	58.32 .06	45.2 +0.2
Nov. 4.4	12.57 −.06	81.5 3.2	58.42 +.02	70.5 0.4	12.93 .08	24.2 2.9	58.36 .03	45.3 0.0
14.4	12.47 .14	84.5 2.9	58.43 −.01	70.8 +0.2	12.81 .15	27.0 2.7	58.38 +.01	45.2 −0.2
24.4	12.28 .22	87.2 2.6	58.41 .03	70.9 0.0	12.64 .20	29.5 2.4	58.38 −.02	44.9 0.3
Dec. 4.3	12.01 .31	89.6 2.1	58.37 .05	70.8 −0.1	12.42 .24	31.7 2.0	58.34 .04	44.6 0.4
14.3	11.67 .38	91.5 1.7	58.30 .08	70.6 0.3	12.15 .28	33.4 1.5	58.29 .07	44.2 0.5
24.3	11.26 .44	92.9 1.1	58.22 .09	70.3 0.4	11.86 .31	34.7 1.0	58.21 .09	43.6 0.5
34.3	10.80 −.48	93.8 +0.6	58.12 −.11	69.8 −0.5	11.54 −.33	35.4 −0.4	58.12 −.10	43.1 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Arietis.		*50 Cassiopeæ.		α Arietis.		ξ¹ Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 47	° ′ +20 12	h m 1 52	° ′ +71 49	h m 2 0	° ′ +22 52	h m 2 6	° ′ +8 16
	s	″	s	″	s	″	s	″
(Dec. 30.3)	51.44 −.10	33.5 −0.3	58.30 −.49	51.7 +1.2	15.20 −.09	60.5 −0.2	29.63 −.08	15.3 −0.6
Jan. 9.3	51.33 .12	33.2 0.5	57.79 .54	52.6 0.7	15.09 .12	60.2 0.4	29.54 .10	14.7 0.6
19.2	51.21 .13	32.6 0.6	57.22 .58	53.0 +0.1	14.97 .13	59.7 0.5	29.42 .12	14.2 0.6
29.2	51.08 .13	32.0 0.7	56.64 .58	52.8 −0.5	14.83 .14	59.1 0.7	29.30 .13	13.6 0.6
Feb. 8.2	50.95 .13	31.2 0.8	56.07 .56	52.0 1.1	14.69 .14	58.4 0.8	29.17 .13	13.1 0.5
18.2	50.82 .12	30.4 0.8	55.53 .52	50.7 1.6	14.56 .13	57.6 0.9	29.05 .12	12.6 0.4
28.2	50 71 .10	29.6 0.9	55.04 .45	48.9 2.0	14.43 .11	56.7 0.9	28.93 .11	12.2 0.3
Mar. 10.1	50.62 .08	28.8 0.8	54.64 .35	46.7 2.4	14.33 .09	55.8 0.9	28.83 .09	11.9 0.2
20.1	50.56 −.04	28.0 0.7	54.34 .24	44.2 2.6	14.26 05	55.0 0.8	28.76 .05	11.8 −0.1
30.1	50.54 .00	27.3 0.6	54 16 −.12	41.5 2.7	14.23 −.01	54.2 0.7	28.72 −.02	11.8 +0.1
Apr. 9.0	50.56 +.05	26.9 0.4	54.11 +.02	38.8 2.7	14.24 +.03	53.5 0.6	28.73 +.02	12.0 0.3
19.0	50.63 .09	26.6 −0.2	54.20 .16	36.1 2.7	14.29 .08	53.1 0.4	28.77 .07	12.4 0.5
29.0	50.75 .14	26.5 +0.1	54.42 .29	33.5 2.5	14.40 .13	52.9 −0.1	28.86 .11	13.0 0.8
May 8.9	50.91 .19	26.8 0.4	54.77 .41	31.2 2.2	14.55 .18	52.9 +0.2	29.00 .16	13.9 1.0
18.9	51.12 .23	27.3 0.6	55.25 .53	29.2 1.8	14.75 .22	53.2 0.4	29.17 .20	15.0 1.2
28.9	51.36 .27	28.0 0.9	55.83 .63	27.5 1.4	14.99 .26	53.8 0.7	29.39 .24	16.3 1.4
June 7.9	51.65 .30	29.1 1.2	56.49 .71	26.3 1.0	15.27 .29	54.6 1.0	29.65 .27	17.8 1.6
17.8	51.95 .32	30.3 1.4	57.23 .77	25.6 −0.5	15.58 .32	55.7 1.2	29.93 .29	19.4 1.7
27.8	52.28 .33	31.8 1.6	58.03 .81	25.4 0.0	15.91 .34	57.0 1.4	30.23 .31	21.2 1.8
July 7.8	52.62 .34	33.5 1.7	58.85 .83	25.7 +0.5	16.25 .35	58.5 1.6	30.55 .32	23.0 1.8
17.8	52.95 .34	35.3 1.8	59.68 .83	26.5 1.0	16.59 .34	60.2 1.7	30.87 .32	24.9 1.8
27.7	53.29 .33	37.1 1.9	60 51 .82	27.7 1.5	16.93 .34	62.0 1.8	31.19 .32	26.7 1.8
Aug. 6.7	53.61 .31	39.0 1.9	61.31 .78	29.4 1.9	17.26 .32	63.8 1.9	31.50 .31	28.4 1.7
16.7	53.91 .29	40.9 1.9	62.07 .74	31.6 2.3	17.57 .30	65.6 1.8	31.80 .29	30.0 1 5
26.6	54.19 .27	42.7 1.8	62.77 .68	34.0 2.6	17.86 .28	67.5 1.8	32.08 .27	31.4 1.3
Sept. 5.6	54.44 .24	44.4 1.7	63.41 .61	36.8 2.9	18.13 .25	69.2 1.7	32.33 .24	32.6 1.1
15.6	54.66 .21	46.0 1.5	63.98 .53	39.9 3.2	18.36 .22	70.9 1.6	32.55 .21	33.6 0.9
25.6	54.85 .17	47.5 1.4	64.46 .44	43.1 3.3	18.57 .19	72.4 1.5	32.75 .18	34.4 0.7
Oct. 5.5	55.01 .14	48.8 1.2	64.85 .34	46.5 3.4	18.74 .16	73.8 1.3	32.92 .15	35.0 0.5
15.5	55.13 .11	49.9 1.0	65.15 .24	49.9 3.5	18.88 .12	75.1 1.2	33.05 .12	35.4 0.3
25.5	55.22 .08	50.8 0.8	65.34 .14	53.4 3.4	18.99 .09	76.1 1.0	33.16 .09	35.6 +0 1
Nov. 4.5	55.28 .05	51.6 0.7	65.43 +.04	56.8 3.3	19.07 .06	77.0 0.8	33.23 .06	35.6 −0.1
14.4	55.32 +.02	52.2 0.5	65.41 −.07	60.0 3.1	19.11 +.03	77.8 0.6	33 28 +.03	35.4 0.2
24.4	55.32 −.01	52.6 0.3	65.29 .18	62.9 2.8	19.13 .00	78.3 0.5	33.29 .00	35.1 0.3
Dec. 4.4	55.29 .04	52.8 +0.1	65.06 .28	65.6 2.5	19.11 −.03	78.7 0.3	33.28 −.02	34.8 0.4
14.3	55.24 .07	52.8 −0.1	64.74 .37	67.9 2.0	19.07 .06	78.9 +0.1	33.25 .05	34.3 0.5
24.3	55.16 .09	52.7 0.2	64.33 .45	69.7 1.6	19.00 .08	78.9 −0.1	33.19 .07	33.8 0.6
34.3	55.07 −.11	52.4 −0.4	63.85 −.51	71.0 +1.2	18.90 −.11	78.7 −0.3	33.10 −.10	33.2 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ι Cassiopeæ.		γ Ceti.		α Ceti.		*48 Cephei (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 18	° ′ +66 50	h m 2 36	° ′ +2 43	h m 2 55	° ′ +3 36	h m 3 4	° ′ +77 16
	s	″	s	″	s	″	s	″
(Dec. 30.3)	57.98 −.33	73.8 +1.3	56.68 −.07	5.7 −0.7	52.11 −.07	28.5 −0.7	49.46 −.54	68.8 +2.2
Jan. 9.3	57.62 .39	74.9 0.9	56.60 .10	5.0 0.7	52.03 .09	27.8 0.7	48.86 .67	70.7 1.7
19.3	57.21 .42	75.5 +0.3	56.49 .12	4.4 0.6	51.93 .11	27.2 0.6	48.14 .77	72.1 1.1
29.2	56.77 .44	75.6 −0.3	56.36 .13	3.8 0.5	51.81 .13	26.6 0.5	47.33 .84	72.9 +0.5
Feb. 8.2	56.33 .44	75.0 0.8	56.23 14	3.4 0.4	51.67 .14	26.1 0.4	46.47 .87	73.1 −0.1
18.2	55.90 .42	74.0 1.3	56.09 .14	3.1 0.3	51.53 .14	25.8 0.3	45.60 .86	72.8 0.7
28.2	55.50 .38	72.5 1.7	55.96 .13	2.9 −0.1	51.39 .14	25.5 −0.2	44.77 .81	71.8 1.2
Mar. 10.1	55.15 .31	70.6 2.1	55.85 .11	2.8 0.0	51.27 .12	25.4 0.0	44.00 .72	70.4 1.7
20.1	54.88 .23	68.4 2.3	55.75 .08	2.9 +0.2	51.16 .10	25.5 +0.1	43.33 .60	68.4 2.1
30.1	54.69 .14	66.0 2.5	55.69 .05	3.2 0.4	51.08 .06	25.7 0.3	42.80 .45	66.2 2.4
Apr. 9.1	54.61 −.03	63.4 2.6	55.66 −.01	3.6 0.6	51.03 −.03	26.1 0.5	42.43 .28	63.6 2.7
19.0	54.63 +.08	60.9 2.5	55.67 +.03	4.3 0.8	51.03 +.02	26.7 0.7	42.24 −.10	60.9 2.8
29.0	54.77 .19	58.4 2.4	55.73 .08	5.3 1.0	51.07 .06	27.6 0.9	42.23 +.09	58.1 2.8
May 9.0	55.01 .29	56.2 2.2	55.83 .13	6.4 1.2	51.15 .11	28.6 1.1	42.42 .28	55.3 2.7
18.9	55.35 .39	54.2 1.8	55.98 .17	7.7 1.4	51.28 .15	29.8 1.3	42.79 .46	52.7 2.5
28.9	55.78 .48	52.5 1.5	56.17 .21	9.2 1.6	51.46 .19	31.2 1.5	43.34 .63	50.3 2.2
June 7.9	56.30 .55	51.2 1.1	56.39 .24	10.8 1.7	51.67 .23	32.8 1.6	44.05 .78	48.2 1.9
17.9	56.88 .61	50.4 0.6	56.65 .27	12.6 1.8	51.92 .26	34.4 1.7	44.89 .91	46.5 1.5
27.8	57.51 .65	50.0 −0.2	56.94 .29	14.4 1.9	52.19 .29	36.2 1.8	45.86 1.01	45.2 1.1
July 7.8	58.18 .68	50.0 +0.3	57.24 .31	16.3 1.9	52.49 .30	37.9 1.8	46.91 1.09	44.4 0.6
17.8	58.86 .69	50.6 0.8	57.55 .32	18.1 1.8	52.80 .31	39.7 1.7	48.03 1.15	44.0 −0.1
27.7	59.55 .68	51.6 1.2	57.87 .32	19.8 1.7	53.11 .31	41.4 1.6	49.19 1.18	44.1 +0.3
Aug. 6.7	60.23 .67	53.0 1.6	58.18 .31	21.4 1.5	53.42 .31	43.0 1.5	50.37 1.18	44.7 0.8
16.7	60.88 .64	54.8 2.0	58.48 .30	22.9 1.3	53 73 .30	44.4 1.3	51.55 1.16	45.7 1.2
26.7	61.50 .60	56.9 2.3	58.77 .28	24.1 1.1	54.02 .29	45.6 1.1	52.69 1.12	47.1 1.7
Sept. 5.6	62.07 .55	59.4 2.6	59.03 .26	25.1 0.9	54.30 .27	46.6 0 9	53.79 1.06	49.0 2.1
15.6	62.59 .49	62.1 2.8	59.28 .23	25.8 0.6	54.55 .24	47.3 0.6	54.81 .99	51.3 2.4
25.6	63.04 .42	65.0 3.0	59.50 .20	26.3 0.4	54.79 .22	47.8 0.3	55.76 .90	53.8 2.7
Oct. 5.6	63.43 .35	68.1 3.2	59.69 .18	26.5 +0.1	54.99 .19	48.0 +0.1	56.60 .79	56.7 3.0
15.5	63.75 .28	71.3 3.2	59.85 .15	26.5 −0.1	55.17 .17	48.0 −0.1	57.32 .66	59.7 3.2
25 5	63.99 .20	74.5 3.2	59.98 .12	26.3 0.3	55.32 .14	47.7 0.3	57.91 .52	63.0 3.3
Nov. 4.5	64.14 .12	77.6 3.1	60.08 .09	25.8 0.5	55.45 .11	47.3 0.5	58.36 .37	66.3 3.4
14.4	64.22 +.03	80.7 3.0	60.15 .06	25.3 0.6	55.54 .08	46.8 0.6	58.65 .21	69.7 3.3
24.4	64.21 −.06	83.6 2.8	60.20 +.03	24.6 0.7	55.60 .05	46.1 0.7	58.78 +.04	73.0 3.2
Dec. 4.4	64.11 .14	86.2 2.5	60.21 .00	23.9 0.8	55.63 +.01	45.4 0.8	58.74 −.13	76.1 3.1
14.4	63.93 .22	88.4 2.1	60.19 −.03	23.1 0.8	55.63 −.02	44.6 0.8	58.53 .29	79.0 2.8
24.3	63.68 .29	90.3 1.7	60.15 .06	22.3 0.8	55.60 .05	43.9 0.8	58.16 .45	81.6 2.4
34.3	63.36 −.35	91.7 +1.2	60.08 −.09	21.6 −0.7	55.54 −.06	43.1 −0.7	57.63 −.59	83.8 +1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Arietis.		α Persei.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 7	+20° 35′	h m 3 15	+49° 25′	h m 3 34	+47° 23′	h m 3 40	+23° 43′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	51.12 −.06	27.2 −0.1	34.21 −.11	35.8 +1.2	11.73 −.08	49.4 +1.2	11.76 −.03	36.2 +0.1
Jan. 9.3	51.04 .09	27.1 0.2	34.08 .15	36.8 0.9	11.63 .13	50.4 0.9	11.71 .07	36.3 0.0
19.3	50.94 .12	26.9 0.3	33.91 .19	37.5 0.5	11.48 .17	51.2 0.6	11.62 .11	36.2 −0.1
29.3	50.82 .14	26.5 0.4	33.70 .22	37.8 +0.1	11.30 .20	51.6 +0.3	11.50 .13	36.1 0.2
Feb. 8.2	50.67 .15	26.1 0.5	33.47 .24	37.7 −0.3	11.08 .23	51.7 −0.1	11.35 .15	35.8 0.3
18.2	50.52 .15	25.6 0.5	33.23 .25	37.3 0.6	10.85 .24	51.4 0.5	11.20 .16	35.5 0.4
28.2	50.37 .15	25.1 0.6	32.98 .24	36.4 1.0	10.61 .23	50.8 0.8	11.03 .16	35.0 0.5
Mar. 10.2	50.22 .13	24.5 0.6	32.75 .22	35.3 1.3	10.38 .22	49.8 1.1	10.87 .15	34.5 0.6
20.1	50.10 .11	23.9 0.6	32.56 18	33.9 1.5	10.18 .19	48.6 1.3	10.73 .13	33.9 0.6
30.1	50.01 .07	23.3 0.5	32.40 .13	32.3 1.7	10.02 .14	47.2 1.5	10.61 .10	33.3 0.6
Apr. 9.1	49.96 −.03	22.9 0.4	32.30 .07	30.6 1.8	9.90 .09	45.7 1.6	10.52 .06	32.7 0.5
19.1	49.95 +.01	22.5 0.3	32.26 −.01	28.8 1.8	9.84 −.03	44.0 1.6	10.48 −.02	32.2 0.4
29.0	49.98 .06	22.3 −0.1	32.29 +.06	27.1 1.7	9.84 +.04	42.4 1.6	10.49 +.03	31.8 0.3
May 9.0	50.07 .11	22.3 +0.1	32.38 .13	25.5 1.6	9.91 .10	40.8 1.5	10.54 .08	31.6 −0.2
19.0	50.20 .16	22.5 0.3	32.55 .20	24.0 1.4	10.05 .17	39.4 1.3	10.65 .13	31.5 0.0
28.9	50.38 .20	22.9 0.5	32.78 .26	22.7 1.1	10.25 .23	38.2 1.1	10.80 .18	31.6 +0.2
June 7.9	50.60 .24	23.5 0.7	33.06 .31	21.8 0.8	10.50 .29	37.2 0.9	11.00 .22	31.9 0.4
17.9	50.86 .28	24.3 0.9	33.40 .36	21.1 0.5	10.81 .33	36.5 0.6	11.23 .26	32.4 0.6
27.9	51.15 .30	25.3 1.1	33.78 .40	20.7 −0.2	11.17 .37	36.0 −0.3	11.51 .29	33.0 0.7
July 7.8	51.46 .32	26.5 1.2	34.20 .43	20.7 +0.1	11.56 .40	35.9 0.0	11.81 .31	33.8 0.9
17.8	51.79 .33	27.7 1.3	34.64 .45	21.0 0.5	11.97 .42	36.1 +0.3	12.13 .33	34.8 1.0
27.8	52.12 .33	29.1 1.4	35.09 .45	21.6 0.8	12.40 .44	36.5 0.6	12.46 .34	35.8 1.1
Aug. 6.8	52.45 .33	30.5 1.4	35.54 .45	22.5 1.1	12.84 .44	37.3 0.9	12.80 .34	37.0 1.2
16.7	52.78 .32	31.9 1.4	35.99 .45	23.7 1.3	13.28 .44	38.3 1.1	13.14 .34	38.2 1.2
26.7	53.10 .31	33.3 1.4	36.43 .43	25.2 1.6	13.71 .43	39.5 1.3	13.47 .33	39.3 1.2
Sept. 5.7	53.40 .29	34.6 1.3	36.85 .41	26.8 1.7	14.13 .41	40.9 1.5	13.79 .31	40.5 1.1
15.6	53.68 .27	35.9 1.2	37.25 .38	28.6 1.9	14.53 .39	42.5 1.7	14.10 .30	41.6 1.1
25.6	53.94 .25	37.0 1.1	37.61 .35	30.6 2.0	14.90 .36	44.2 1.8	14.38 .28	42.6 1.0
Oct. 5.6	54.18 .22	38.0 0.9	37.95 .32	32.7 2.1	15.24 .33	46.0 1 9	14.65 .26	43.5 0.9
15.6	54.38 .19	38.8 0.8	38.24 .28	34.8 2.2	15.55 .29	47.9 2.0	14.90 .23	44.4 0.8
25.5	54.56 .16	39.6 0.6	38.60 .24	37.0 2.2	15.83 .26	49.9 2.0	15.11 .20	45.1 0.7
Nov. 4.5	54.71 .13	40.1 0.5	38.71 .19	39.2 2.2	16.06 .21	51.9 2.0	15.30 .17	45.8 0.6
14.5	54.83 .10	40.6 0.4	38.88 .14	41.3 2.1	16.25 .17	53.8 1.9	15.45 .14	46.3 0.5
24.5	54.91 .07	40.9 0.3	39.00 .09	43.4 2.0	16.39 .12	55.7 1.9	15.58 .10	46.8 0.4
Dec. 4.4	54.96 +.03	41.2 0.2	39.06 +.04	45.3 1.8	16.48 .06	57.5 1.7	15.66 .07	47.2 0.3
14.4	54.98 .00	41.3 +0.1	39.07 −.02	47.0 1.6	16.52 +.01	59.1 1.6	15.71 +.03	47.4 0.3
24.4	54.96 −.04	41.3 0.0	39.02 .07	48.5 1.4	16.50 −.04	60.6 1.3	15.72 −.01	47.7 0.2
34.4	54.90 −.07	41.2 −0.1	38.92 −.12	49.7 +1.1	16.43 −.09	61.8 +1.1	15.69 −.05	47.8 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ¹ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 46	° ′ +31 31	h m 3 52	° ′ −13 51	h m 4 12	° ′ +15 19	h m 4 21	° ′ +18 54
	s	″	s	″	s	″	s	″
(Dec. 30.4)	25.54 −.04	13.9 +0.5	18.87 −.05	30.1 −1.5	49.10 −.01	55.3 −0.3	27.59 .00	33.1 −0.1
Jan. 9.3	25.48 .06	14.4 0.4	18.81 .08	31.5 1.3	49.08 .05	55.0 0.3	27.57 −.04	33.0 0.1
19.3	25.39 .11	14.6 +0.2	18.71 .11	32.7 1.1	49.01 .08	54.7 0.3	27.51 .08	32.8 0.2
29.3	25.26 .14	14.7 0.0	18.59 .14	33.6 0.8	48.91 .12	54.4 0.3	27.42 .11	32.7 0.2
Feb. 8.3	25.10 .17	14.6 −0.2	18.44 .16	34.3 0.5	48.78 .14	54.1 0.3	27.29 .14	32.5 0.2
18.2	24.93 .18	14.3 0.4	18.28 .17	34.7 −0.2	48.63 .16	53.8 0.3	27.14 .16	32.2 0.3
28.2	24.75 .18	13.8 0.6	18.11 .17	34.8 +0.1	48.47 .16	53.5 0.3	26.98 .17	31.9 0.3
Mar. 10.2	24.57 .17	13.2 0.7	17.94 .16	34.5 0.4	48.31 .16	53.2 0.3	26.81 .16	31.6 0.3
20.2	24.41 .15	12.5 0.8	17.79 .15	34.0 0.7	48.16 .14	53.0 0.2	26.65 .15	31.3 0.3
30.1	24.28 .12	11.6 0.9	17.65 .12	33.2 0.9	48.03 .12	52.8 0.2	26.52 .13	31.0 0.3
Apr. 9.1	24.18 .08	10.7 0.9	17.56 .09	32.1 1.2	47.93 .08	52.6 −0.1	26.41 .09	30.8 0.3
19.1	24.13 −.03	9.9 0.9	17.48 −.05	30.8 1.5	47.86 −.05	52.5 0.0	26.33 .06	30.5 0.2
29.0	24.13 +.02	9.0 0.8	17.46 .00	29.2 1.7	47.84 .00	52.6 +0.1	26.30 −.01	30.4 −0.1
May 9.0	24.18 .06	8.3 0.6	17.48 +.04	27.4 1.9	47.86 +.04	52 8 0.3	26.31 +.04	30.4 0.0
19.0	24.28 .13	7.8 0.5	17.54 .09	25.4 2.1	47.92 .09	53.1 0.4	26.37 .09	30.5 +0.2
29.0	24.44 .18	7.4 0.3	17.65 .13	23.2 2.2	48.03 .14	53.6 0.6	26.48 .13	30.7 0.3
June 7.9	24.65 .23	7.2 −0.1	17.80 .17	20.9 2.3	48.19 .18	54.2 0.7	26.63 .18	31.1 0.5
17.9	24.89 .27	7.2 +0.1	17.99 .21	18.6 2.3	48.39 .22	55.0 0.8	26.83 .22	31.6 0.6
27.9	25.18 .30	7.4 0.3	18.22 .24	16.3 2.3	48.63 .25	55.9 1.0	27.06 .25	32.3 0.7
July 7.9	25.49 .33	7.9 0.5	18.47 .27	14.1 2.2	48.89 .28	56.9 1.1	27.33 .28	33.1 0.9
17.8	25.83 .35	8.5 0.7	18.75 .29	12.0 2.0	49.18 .30	58.0 1.1	27.61 .30	34.0 0.9
27.8	26.18 .36	9.3 0.9	19.05 .30	10.1 1.8	49.48 .31	59.1 1.1	27.92 .31	34.9 1.0
Aug. 6.8	26.54 .36	10.2 1.0	19.35 .31	8.4 1.5	49.80 .32	60.2 1.1	28.24 .32	35.9 1.0
16.7	26.90 .36	11.3 1.1	19.65 .30	7.0 1.2	50.12 .32	61.3 1.0	28.56 .33	36.8 0.9
26.7	27.26 .35	12.4 1.2	19.96 .30	6.0 0.8	50.43 .32	62.2 0.9	28.89 .32	37.7 0.9
Sept. 5.7	27.60 .34	13.6 1.2	20.25 .29	5.4 +0.4	50.75 .31	63.1 0.8	29.21 .32	38.6 0.8
15.7	27.93 .32	14.8 1.2	20.53 .28	5.2 0.0	51.05 .30	63.9 0.7	29.52 .31	39.3 0.7
25.6	28.25 .30	16.0 1.2	20.80 .26	5.4 −0.4	51.34 .28	64.5 0.5	29.82 .29	40.0 0.6
Oct. 5.6	28.54 .28	17.2 1 2	21.04 .23	6.0 0.8	51.61 .27	64.9 0.4	30.10 .28	40.5 0.5
15.6	28.80 .25	18.3 1.1	21.27 .21	6.9 1.1	51.87 .25	65.2 0.2	30.37 26	40.9 0.3
25.6	29.04 .22	19.4 1.1	21.46 .18	8.2 1.4	52.10 .22	65.3 +0.1	30.62 .22	41.1 0.2
Nov. 4.5	29.25 .19	20.5 1.0	21.63 .15	9.7 1.6	52.31 .19	65.3 0.0	30.84 .21	41.3 0.1
14.5	29.42 .16	21.5 1.0	21.77 .12	11.4 1.8	52.49 .17	65.2 −0.1	31.03 .18	41.4 +0.1
24.5	29.56 .12	22.4 0.9	21.87 .09	13.2 1.9	52.64 .13	65.1 0.2	31.19 .14	41.4 0.0
Dec. 4.4	29.65 .08	23.3 0.8	21.94 .05	15.1 1.9	52.75 .10	64.9 0.3	31.32 .11	41.4 −0.1
14.4	29.71 +.03	24.0 0.7	21.97 +.01	16.9 1.8	52.83 .06	64.6 0.3	31.40 .07	41.3 0.1
24.4	29.72 −.01	24.7 0.6	21.96 −.02	18.6 1.7	52.87 +.02	64.3 0.3	31.45 +.03	41.2 0.1
34.4	29.69 −.06	25.2 +0.4	21.92 −.06	20.2 −1.5	52.86 −.03	64.0 −0.3	31.46 −.02	41.1 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran.*)		*9 Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 28	° ′ +16 15	h m 4 41	° ′ +66 7	h m 4 48	° ′ +32 58	h m 4 57	° ′ +15 13
	s	″	s	″	s	″	s	″
(Dec. 30.4)	53.33 +.01	48.2 −0.2	52.97 −.05	67.6 +2.4	60.83 +.03	22.6 +0.7	34.14 +.03	61.9 −0.3
Jan. 9.4	53.32 −.04	48.0 0.2	52.88 .15	69.8 2.1	60.83 −.02	23.3 0.6	34.14 −.01	61.6 0.3
19.4	53.26 .07	47.7 0.2	52.68 .24	71.8 1.8	60.78 .07	23.8 0.5	34.11 .05	61.3 0.3
29.3	53.17 .11	47.5 0.3	52.40 .32	73.4 1.4	60.69 .12	24.3 0.4	34.04 .09	61.1 0.3
Feb. 8.3	53.05 .14	47.3 0.3	52.05 .38	74.6 1.0	60.55 .15	24.6 +0.2	33.93 .13	60.8 0.2
18.3	52.90 .16	47.0 0.3	51.64 .43	75.3 +0.5	60.39 .18	24.7 0.0	33.79 .15	60.6 0.2
28.2	52.74 .17	46.7 0.3	51.20 .45	75.5 0.0	60.20 .19	24.6 −0.2	33.63 .16	60.4 0.2
Mar. 10.2	52.58 .16	46.4 0.3	50.75 .44	75.2 −0.5	60.01 .19	24.4 0.3	33.46 .17	60.2 0.2
20.2	52.42 .15	46.2 0.3	50.32 .42	74.4 1.0	59.83 .18	23.9 0.5	33.30 .16	60.1 0.2
30.2	52.28 .13	46.0 0.2	49.93 .37	73.2 1.4	59.65 .16	23.4 0.6	33.15 .14	59.9 0.1
Apr. 9.1	52.16 .10	45.8 0.2	49.59 .30	71.7 1.7	59.51 .13	22.7 0.7	33.02 .12	59.8 −0.1
19.1	52.08 .06	45.7 −0.1	49.33 .22	69.8 2.0	59.40 .09	22.0 0.8	32.92 .08	59.8 0.0
29.1	52.04 −.02	45.7 +0.1	49.15 .12	67.7 2.2	59.33 −.04	21.2 0.8	32.86 −.04	59.8 +0.1
May 9.1	52.05 +.03	45.8 0.2	49.08 −.02	65.4 2.3	59.32 +.01	20.4 0.8	32.84 .00	60.0 0.2
19.0	52.10 .08	46.0 0.3	49.11 +.08	63.1 2.3	59.36 .07	19.7 0.7	32.86 +.05	60.2 0.3
29.0	52.20 .12	46.4 0.5	49.24 .19	60.8 2.3	59.45 .12	19.1 0.6	32.93 .09	60.6 0.4
June 8.0	52.34 .17	46.9 0.6	49.48 .28	58.5 2.2	59.59 .17	18.5 0.5	33.05 .14	61.1 0.5
17.9	52.53 .20	47.6 0.7	49.81 .38	56.4 2.0	59.78 21	18.1 0.3	33.21 .18	61.7 0.7
27.9	52.75 .24	48.4 0.8	50.23 .46	54.6 1.7	60.02 .25	17.9 −0.2	33.40 .21	62.4 0.8
July 7.9	53.01 .27	49.2 0.9	50.72 .53	53.0 1.5	60.29 .29	17.8 0.0	33.63 .25	63.2 0.8
17.9	53.29 .29	50.2 1.0	51.27 .59	51.7 1.1	60.59 .32	17.8 +0.1	33.89 .27	64.0 0.9
27.8	53.58 .31	51.2 1.0	51.88 .63	50.7 0.8	60.91 .34	18.0 0.3	34.17 .29	64.9 0.9
Aug. 6.8	53.89 .31	52.1 1.0	52.53 .67	50.1 0.4	61.26 .35	18.4 0.4	34.47 .30	65.8 0.8
16.8	54.21 .32	53.1 0.9	53.21 .69	40.9 −0.1	61.61 .36	18.8 0.5	34.77 .31	66.6 0.8
26.8	54.53 .32	54.0 0.8	53.90 .70	49.9 +0.3	61.97 .36	19.3 0.6	35.09 .31	67.3 0.7
Sept. 5.7	54.85 .31	54.7 0.7	54.60 .69	50.4 0.6	62.33 .36	19.9 0.6	35.40 .31	67.9 0.6
15.7	55.15 .30	55.4 0.6	55.29 .68	51.2 1.0	62.69 .35	20.5 0.7	35.71 .31	68.4 0.4
25.7	55.45 .29	55.9 0.5	55.96 .66	52.3 1.3	63.04 .34	21.2 0.7	36.02 .30	68.7 0.3
Oct. 5.6	55.74 .28	56.3 0.3	56.61 .63	53.7 1.6	63.38 .33	21.9 0.7	36.32 .29	68.9 +0.1
15.6	56.01 .26	56.6 +0.2	57.22 .59	55.4 1.9	63.70 .31	22.6 0.7	36.60 .26	69.0 0.0
25.6	56.25 .24	56.7 0.0	57.78 .53	57.4 2.1	64.00 .29	23.3 0.7	36.87 .26	68.9 −0.2
Nov. 4.6	56.48 .21	56.6 −0.1	58.28 .47	59.6 2.3	64.28 .26	24.0 0.7	37.11 .23	68.7 0.3
14.5	56.67 .18	56.5 0.2	58.71 .40	62.0 2.5	64.52 .23	24.8 0.7	37.33 .21	68.4 0.3
24.5	56.84 .15	56.3 0.2	59.07 .31	64 6 2.6	64.73 .19	25.5 0.8	37.53 .18	68.0 0.4
Dec. 4.5	56.97 .11	56.1 0.2	59.34 .22	67.1 2.6	64.91 .15	26.3 0.8	37.69 .14	67.6 0.4
14.5	57.06 .07	55.9 0.3	59.50 .12	69.7 2.6	65.04 .11	27.0 0.7	37.81 .10	67.2 0.4
24.4	57.12 +.03	55.6 0.3	59.57 +.02	72.3 2.5	65.12 +.06	27.7 0.7	37.89 .06	66.9 0.4
34.4	57.13 −.01	55.3 −0.3	59.54 −.09	74.6 +2.2	65.15 .00	28.4 +0.7	37·92 +.02	66.5 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		*Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 7	° ′ +45 52	h m 5 8	° ′ −8 20	h m 5 18	° ′ +28 30	h m 5 23	° ′ +74 57
	s	″	s	″	s	″	s	″
(Dec. 30.4)	38.41 +.05	27.1 +1.4	39.21 +.03	36.6 −1.6	32.82 +.06	16.2 +0.4	23.05 +.03	42.3 +2.8
Jan. 9.4	38.43 −.02	28.4 1.3	39.21 −.02	38.1 1.5	32.85 +.01	16.6 0.4	22.99 −.15	45.0 2.7
19.4	38.38 .08	29.7 1.1	39.17 .06	39.5 1.3	32.83 −.04	17.0 0.4	22.76 .31	47.6 2.4
29.4	38.27 .13	30.7 0.9	39.09 .10	40.7 1.1	32.76 .09	17.3 0.3	22.39 .45	49.8 2.0
Feb. 8.3	38.11 .18	31.5 0.7	38.97 .13	41.6 0.8	32.66 .13	17.5 0.2	21.88 .57	51.6 1.6
18.3	37.92 .21	32.0 0.4	38.83 .15	42.3 0.6	32.51 .16	17.7 +0.1	21.27 .66	53.0 1.1
28.3	37.69 .23	32.2 +0.1	38.67 .17	42.8 0.3	32.34 .18	17.7 0.0	20.58 .71	53.8 +0.6
Mar. 10.2	37.45 .24	32.2 −0.2	38.49 .18	43.0 −0.1	32.16 .18	17.7 −0.1	19.85 .74	54.1 0.0
20.2	37.21 .23	31.8 0.5	38.32 .17	42.9 +0.2	31.96 .18	17.5 0.3	19.12 .72	53.8 −0.5
30.2	37.00 .21	31.1 0.8	38.16 .16	42.6 0.4	31.80 .17	17.1 0.4	18.42 .67	53.1 1.0
Apr. 9.2	36.80 .17	30.2 1.0	38.01 .13	42.0 0.7	31.65 .14	16.7 0.4	17.79 .59	51.8 1.5
19.1	36.64 .13	29.1 1.2	37.90 .10	41.2 0.9	31.53 .10	16.2 0.5	17.25 .49	50.1 1.9
29.1	36.54 .08	27.8 1.3	37.81 .06	40.2 1.2	31.44 .06	15.7 0.5	16.82 .36	48.0 2.2
May 9.1	36.49 −.02	26.5 1.4	37.77 −.02	38.9 1.4	31.40 −.02	15.2 0.5	16.54 .21	45.6 2.5
19.1	36.51 +.04	25.1 1.4	37.77 +.02	37.4 1.6	31.41 +.03	14.7 0.5	16.40 −.06	43.1 2.6
29.0	36.58 .11	23.7 1.4	37.81 .06	35.8 1.7	31.47 .08	14.3 0.4	16.41 +.09	40.5 2.7
June 8.0	36.72 .17	22.4 1.3	37.90 .11	34.0 1.8	31.58 .13	13.9 0.3	16.59 .25	37.8 2.7
18.0	36.91 .22	21.1 1.2	38.03 .15	32.2 1.9	31.73 .18	13.7 0.2	16.91 .39	35.2 2.6
27.9	37.16 .27	20.1 1.0	38.19 .18	30.3 1.9	31.93 .22	13.5 −0.1	17.37 .53	32.7 2.4
July 7.9	37.46 .32	19.1 0.8	38.39 .21	28.3 1.9	32.16 .25	13.5 0.0	17.97 .66	30.4 2.2
17.9	37.79 .35	18.4 0.6	38.62 .24	26.5 1.8	32.43 .28	13.5 +0.1	18.68 .77	28.3 1.9
27.9	38.16 .38	17.9 0.4	38.87 .26	24.7 1.7	32.72 .30	13.7 0.2	19.49 .86	26.5 1.6
Aug. 6.8	38.55 .40	17.6 −0.2	39.14 .28	23.2 1.5	33.03 .32	13.9 0.3	20.39 .93	25.1 1.3
16.8	38.96 .42	17.5 0.0	39.42 .29	21.8 1.2	33.36 .34	14.2 0.3	21.35 .99	24.1 0.9
26.8	38.38 .43	17.5 +0.2	39.71 .30	20.8 0.9	33.70 .34	14.5 0.3	22.37 1.03	23.4 0.5
Sept. 5.8	39.81 .41	17.8 0.3	40.01 .30	20.1 0.5	34.04 .35	14.9 0.3	23.42 1.06	23.1 −0.1
15.7	40.24 .43	18.2 0.1	40.30 .29	19.7 +0.2	34.39 .34	15.2 0.3	24.48 1.06	23.2 +0.3
25.7	40.66 .42	18.8 0.7	40.59 .29	19.7 −0.2	34.73 .34	15.5 0.3	25.53 1.05	23.7 0.7
Oct. 5.7	41.07 .40	19.5 0.8	40.88 .28	20.1 0.6	35.07 .33	15.9 0.3	26.57 1.02	24.6 1.1
15.6	41.46 .39	20.4 1.0	41.15 .26	20.8 0.9	35.39 .31	16.2 0.3	27.57 .97	25.8 1.5
25.6	41.84 .36	21.5 1.1	41.40 .25	21.9 1.2	35.70 .30	16.5 0.3	28.51 .90	27.5 1.8
Nov. 4.6	42.18 .32	22.6 1.2	41.64 .22	23.2 1.5	35.99 .28	16.7 0.3	29.37 .82	29.5 2.1
14.6	42.49 .29	23.9 1.3	41.85 .20	24.8 1.7	36.25 .25	17.0 0.3	30.14 .71	31.8 2.4
24.5	42.76 .25	25.2 1.4	42.03 .17	26.5 1.8	36.49 .22	17.3 0.3	30.79 .58	34.3 2.7
Dec. 4.5	42.98 .20	26.6 1.4	42.18 .13	28.3 1.8	36.69 .18	17.7 0.4	31.30 .44	37.0 2.8
14.5	43.16 .14	28.1 1.5	42.29 .09	30.1 1.8	36.85 .13	18.0 0.4	31.67 .29	39.9 2.9
24.5	43.27 .08	29.5 1.4	42.36 .05	31.9 1.7	36.96 .09	18.4 0.4	31.87 +.12	42.8 2.9
34.4	43.32 +.02	30.9 +1.4	42.38 +.01	33.6 −1.6	37.02 +.04	18.8 +0.4	31.91 −.04	45.6 +2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		.· Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 5 25	° ′ −0 23	h m 5 27	° ′ −17 54	h m 5 29	° ′ −1 16	h m 5 35	° ′ −34 7
	s	″	s	″	s	″	s	″
(Dec. 30.4)	45.03 +.05	23.6 −1.3	20.06 +.03	36.1 −2.2	59.96 +.05	48.3 −1.4	13.63 +.01	81.6 −2.9
Jan. 9.4	45.05 .00	24.9 1.2	20.07 −.02	38.2 2.0	59.99 .00	49.6 1.2	13.61 −.05	84.4 2.6
19.4	45.03 −.04	26.0 1.0	20.03 .06	40.1 1.7	59.97 −.04	50.7 1.1	13.54 .09	86.8 2.3
29.4	44.97 .08	26.9 0.9	19.95 .10	41.7 1.5	59.91 .08	51.7 0.9	13.42 .14	89.0 1.9
Feb. 8.3	44.87 .12	27.7 0.7	19.83 .14	43.0 1.1	59.81 .11	52.5 0.7	13.26 .18	90.7 1.5
18.3	44.74 .14	28.2 0.5	19.68 .16	43.9 0.8	59.69 .14	53.1 0.5	13.07 .21	92.0 1.1
28.3	44.59 .16	28.6 0.3	19.50 .18	44.6 0.5	59.53 .16	53.6 0.3	12.85 .23	92.9 0.7
Mar. 10.3	44.43 .17	28.9 −0.1	19.32 .19	44.9 −0.1	59.37 .17	53.8 −0.1	12.62 .24	93.3 −0.2
20.2	44.26 .17	28.9 +0.1	19.13 .19	44.8 +0.2	59.20 .17	53.8 +0.1	12.39 .24	93.3 +0.3
30.2	44.10 .15	28.8 0.2	18.94 .18	44.5 0.5	59.04 .16	53.7 0.2	12.15 .23	92.8 0.7
Apr. 9.2	43.95 .13	28.4 0.4	18.78 .15	43.8 0.9	58.89 .14	53.4 0.4	11.94 .20	91.9 1.1
19.1	43.83 .10	27.9 0.6	18.64 .13	42.8 1.2	58.77 .11	52.8 0.6	11.75 .17	90.6 1.5
29.1	43.75 .07	27.3 0.8	18.53 .09	41.5 1.4	58.68 .07	52.1 0.8	11.60 .14	88.9 1 9
May 9.1	43.70 −.03	26.4 0.9	18.46 .05	39.9 1.7	58.63 −.03	51.3 1.0	11.48 .09	86.9 2.2
19.1	43.69 +.01	25.4 1.1	18.43 −.01	38.1 1.9	58.61 +.01	50.2 1.1	11.41 −.05	81.6 2.5
29.0	43.72 .06	24.3 1.2	18.45 +.04	36.1 2.1	58.64 .05	49.0 1.3	11.39 .00	82.0 2.7
June 8.0	43.80 .10	23.0 1.4	18.50 .08	34.0 2.2	58.72 .09	47.7 1.4	11.42 +.05	79.3 2.8
18.0	43.92 .14	21.6 1.4	18.61 .12	31.7 2.3	58.83 .13	46.3 1.5	11.49 .10	76.4 2.9
28.0	44.07 .17	20.1 1.5	18.75 .16	29.4 2.3	58.98 .17	44.8 1.5	11.61 .14	73.5 2.9
July 7.9	44.26 .21	18.6 1.5	18.92 .19	27.1 2.3	59.17 .20	43.2 1.5	11.77 .18	70.6 2.8
17.9	44.48 .23	17.1 1.4	19.13 .22	24.9 2.2	59.38 .23	41.7 1.5	11.98 .22	67.9 2.7
27.9	44.73 .26	15.7 1.4	19.37 .25	22.8 2 0	59.62 .25	40.3 1.4	12.21 .25	65.3 2.4
Aug. 6.8	44.99 .27	14.5 1.2	19.63 .27	21.0 1.7	59.88 .27	39.0 1.2	12.48 .28	63.0 2.1
16.8	45.27 .29	13.3 1.0	19.90 .28	19.4 1.4	60.16 .28	37.9 1.0	12.77 .30	61.2 1.7
26.8	45.56 .29	12.4 0.8	20.19 .30	18.2 1.0	60.45 .29	37.0 0.8	13.07 .31	59.7 1.2
Sept. 5.8	45.86 .30	11.8 0.5	20.49 .30	17.4 0.6	60.74 .30	36.3 0.5	13.39 .32	58.8 0.7
15.7	46.15 .30	11.4 +0.2	20.79 .30	17.0 +0.2	61.04 .30	36.0 +0.2	13.72 .33	58.3 +0.2
25.7	46.45 .29	11.4 −0.1	21.09 .30	17.1 −0.3	61.33 .29	35.9 −0.1	14.04 .32	58.5 −0.4
Oct. 5.7	46.74 .29	11.6 0.4	21.38 .29	17.6 0.8	61.62 .29	36.2 0.4	14.36 .32	59.1 1.0
15.7	47.02 .28	12.2 0.7	21.66 .28	18.5 1.2	61.91 .28	36.8 0.7	14.67 .30	60.4 1.5
25.6	47.29 .26	13.0 0.9	21.93 .26	19.9 1.6	62.18 .26	37.6 1.0	14.96 .28	62.1 2.0
Nov. 4.6	47.54 .24	14.0 1.1	22.18 .24	21.6 1.9	62.43 .24	38.7 1.2	15.23 .25	64.3 2.4
14.6	47.77 .22	15.2 1.3	22.40 .21	23.6 2.1	62.66 .22	40.0 1.4	15.47 .22	66.8 2.7
24.5	47.97 .19	16.6 1.4	22.59 .18	25.8 2.3	62.87 .19	41.4 1.5	15.67 .18	69.7 2.9
Dec. 4.5	48.14 .15	18.0 1.4	22.75 .14	28.1 2.4	63.04 .16	42.9 1.5	15.83 .14	72.7 3.1
14.5	48.27 .12	19.4 1.4	22.87 .10	30.5 2.4	63.18 .12	44.4 1.5	15.94 .09	75.7 3.1
24.5	48.37 .07	20.8 1.4	22.95 .06	32.8 2.3	63.27 .08	45.8 1.4	16.01 +.04	78.7 3.0
34.4	48.42 +.03	22.1 −1.3	22.98 +.01	35.1 −2.1	63.33 +.03	47.2 −1.3	16.02 −.02	81.6 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		*22 Camelop. (H.)		μ Geminorum.		α Argus. (*Canopus.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 5 48	° ′ +7 23	h m 6 5	° ′ +69 21	h m 6 15	° ′ +22 34	h m 6 21	° ′ −52 37
	s	″	s	″	s	″	s	″
(Dec. 30.5)	32.46 +.07	4.5 −0.9	21.68 +.16	44.8 +2.6	33.04 +.11	37.4 −0.1	15.70 +.02	38.9 −3.5
Jan. 9.5	32.51 +.03	3.7 0.8	21.77 +.03	47.4 2.6	33.13 .06	37.4 0.0	15.68 −.06	42.3 3.4
19.4	32.52 −.02	2.9 0.7	21.74 −.10	49.9 2.4	33.17 +.01	37.5 +0.1	15.58 .13	45.6 3.1
29.4	32.48 .06	2.3 0.6	21.58 .22	52.2 2.2	33.15 −.04	37.6 0.1	15.43 .19	48.5 2.7
Feb. 8.4	32.40 .10	1.7 0.5	21.31 .32	54.2 1.9	33.09 .08	37.7 0.2	15.21 .25	51.0 2.3
18.3	32.28 .13	1.3 0.3	20.94 .41	55.8 1.5	32.99 .12	37.9 0.2	14.94 .29	53.1 1.8
28.3	32.14 .15	1.1 0.2	20.49 .48	57.1 1.0	32.85 .15	38.0 0.1	14.63 .33	54.6 1.3
Mar. 10.3	31.98 .17	0.9 −0.1	20.00 .51	57.8 +0.5	32.69 .17	38.1 +0.1	14.29 .35	55.7 0.8
20.3	31.81 .17	0.8 0.0	19.48 .52	58.1 0.0	32.51 .18	38.2 0.0	13.94 .36	56.3 −0.3
30.2	31.65 .16	0.8 +0.1	18.96 .51	57.9 −0.5	32.34 .17	38.2 0.0	13.58 .35	56.3 +0.2
Apr. 9.2	31.50 .14	1.0 0.2	18.46 .47	57.1 1.0	32.17 .16	38.1 −0.1	13.24 .34	55.9 0.7
19.2	31.37 .12	1.2 0.3	18.03 .41	56.0 1.4	32.03 .13	38.0 0.1	12.91 .31	54.9 1.2
29.2	31.27 .08	1.6 0.4	17.66 .33	54.4 1.8	31.91 .10	37.9 0.2	12.62 .27	53.5 1.7
May 9.1	31.21 −.04	2.0 0.5	17.38 .23	52.5 2.1	31.84 .06	37.7 0.2	12.37 .23	51.6 2.1
19.1	31.19 .00	2.6 0.6	17.20 .12	50.3 2.3	31.79 −.02	37.6 0.1	12.17 .18	49.3 2.5
29.1	31.21 +.04	3.3 0.8	17.13 −.01	47.9 2.4	31.80 +.03	37.5 0.1	12.02 .12	46.7 2.8
June 8.0	31.28 .08	4.1 0.9	17.18 +.10	45.5 2.5	31.84 .07	37.3 0.1	11.94 −.06	43.8 3.0
18.0	31.38 .12	5.0 0.9	17.33 .21	43.0 2.5	31.94 .11	37.3 −0.1	11.91 .00	40.7 3.1
28.0	31.52 .16	5.9 1.0	17.59 .32	40.5 2.4	32.07 .15	37.2 0.0	11.94 +.06	37.6 3.2
July 8.0	31.70 .19	6.9 1.0	17.96 .41	38.1 2.3	32.24 .19	37.3 0.0	12.04 .12	34.3 3.2
17.9	31.91 .22	7.9 1.0	18.42 .50	35.9 2.1	32.44 .22	37.3 +0.1	12.19 .18	31.1 3.1
27.9	32.15 .25	8.9 1.0	18.96 .58	33.9 1.9	32.68 .25	37.4 0.1	12.39 .23	28.1 2.9
Aug. 6.9	32.40 .27	9.8 0.9	19.57 .64	32.1 1.7	32.94 .27	37.5 0.1	12.65 .28	25.4 2.6
16.9	32.68 .28	10.6 0.7	20.24 .70	30.6 1.4	33.22 .29	37.5 +0.1	12.95 .32	23.0 2.2
26.8	32.96 .29	11.3 0.6	20.96 .74	29.4 1.1	33.52 .31	37.6 0.0	13.29 .36	21.0 1.7
Sept. 5.8	33.26 .30	11.7 0.4	21.72 .77	28.5 0.7	33.83 .32	37.6 0.0	13.66 .38	19.5 1.2
15.8	33.56 .30	12.0 +0.1	22.50 .79	27.9 −0.4	34.15 .33	37.5 −0.1	14.06 .40	18.7 +0.6
25.7	33.87 .30	12.0 −0.1	23.30 .80	27.7 0.0	34.48 .33	37.3 0.2	14.47 .41	18.4 −0.1
Oct. 5.7	34.17 .30	11.8 0.3	24.10 .80	27.9 +0.4	34.81 .33	37.1 0.3	14.88 .41	18.8 0.7
15.7	34.46 .29	11.4 0.5	24.89 .78	28.5 0.7	35.14 .33	36.8 0.3	15.29 .40	19.8 1.3
25.7	34.75 .28	10.8 0.7	25.66 .75	29.4 1.1	35.46 .32	36.5 0.4	15.68 .38	21.4 1.9
Nov. 4.6	35.02 .26	10.0 0.9	26.38 .70	30.6 1.4	35.77 .31	36.1 0.4	16.05 .35	23.6 2.5
14.6	35.27 .24	9.1 1.0	27.05 .64	32.2 1.8	36.07 .29	35.7 0.4	16.38 .31	26.3 2.9
24.6	35.50 .21	8.1 1.1	27.64 .56	34.2 2.1	36.35 .26	35.3 0.3	16.66 .26	29.4 3.3
Dec. 4.6	35.70 .18	7.0 1.1	28.15 .46	36.3 2.3	36.59 .23	35.0 0.3	16.89 .20	32.8 3.5
14.5	35.86 .14	6.0 1.0	28.56 .35	38.7 2.5	36.80 .19	34.8 0.2	17.05 .13	36.3 3.6
24.5	35.99 .10	4.9 1.0	28.85 .23	41.2 2.6	36.96 .14	34.6 0.1	17.15 +.06	40.0 3.6
34.5	36.07 +.06	4.0 −0.9	29.02 +.11	43.8 +2.6	37.08 +.09	34.5 −0.1	17.18 −.01	43.5 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.		δ Canis Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 30	+16° 30′	h m 6 39	−16° 32′	h m 6 53	−28° 48′	h m 7 3	−26° 11′
	s	″	s	″	s	″	s	″
(Dec. 30.5)	38.19 +.13	16.4 −0.5	45.25 +.11	50.4 −2.4	49.31 +.10	13.9 −3.0	25.15 +.12	47.9 −2.9
Jan. 9.5	38.29 .08	16.0 0.4	45.33 +.05	52.8 2.3	49.39 +.05	16.8 2.9	25.24 .06	50.8 2.8
19.4	38.33 +.02	15.7 0.3	45.35 .00	55.0 2.1	49.41 .00	19.6 2.7	25.28 +.01	53.5 2.6
29.4	38.33 −.03	15.5 0.2	45.33 −.05	57.0 1.8	49.38 −.05	22.1 2.4	25.27 −.04	56.0 2.4
Feb. 8.4	38.28 .07	15.3 −0.1	45.26 .09	58.7 1.6	49.30 .10	24.4 2.1	25.20 .09	58.2 2.0
18.4	38.19 .11	15.3 0.0	45.15 .13	60.1 1.3	49.18 .14	26.3 1.7	25.09 .13	60.1 1.7
28.3	38.07 .14	15.3 0.0	45.01 .15	61.2 1.0	49.02 .18	27.8 1.3	24.95 .16	61.6 1.3
Mar. 10.3	37.92 .16	15.3 0.0	44.85 .17	62.0 0.6	48.83 .20	28.9 0.9	24.77 .19	62.7 1.0
20.3	37.75 .17	15.3 +0.1	44.67 .18	62.4 −0.3	48.63 .21	29.6 0.5	24.58 .20	63.5 0.6
30.3	37.58 .17	15.4 0.1	44.48 .19	62.6 0.0	48.42 .21	29.9 −0.1	24.38 .21	63.8 −0.2
Apr. 9.2	37.42 .16	15.4 0.1	44.30 .18	62.4 +0.3	48.21 .21	29.8 +0.3	24.17 .20	63.8 +0.2
19.2	37.28 .13	15.5 0.1	44.13 .16	61.9 0.7	48.01 .19	29.3 0.7	23.98 .18	63.3 0.6
29.2	37.16 .11	15.6 0.1	43.99 .13	61.1 0.9	47.83 .16	28.4 1.1	23.81 .16	62.5 1.0
May 9.2	37.07 .07	15.7 0.1	43.88 .10	60.0 1.2	47.68 .13	27.1 1.4	23.67 .13	61.4 1.3
19.1	37.02 −.03	15.8 0.2	43.79 .06	58.7 1.4	47.57 .10	25.5 1.7	23.55 .10	59.9 1.6
29.1	37.01 +.01	16.0 0.2	43.75 −.02	57.1 1.7	47.49 .06	23.6 2.0	23.47 .06	58.2 1.9
June 8.1	37.04 .05	16.2 0.2	43.75 +.01	55.4 1.8	47.45 −.02	21.5 2.2	23.43 −.02	56.2 2.1
18.0	37.11 .09	16.4 0.3	43.78 .05	53.5 1.9	47.46 +.02	19.2 2.4	23.43 +.02	54.1 2.3
28.0	37.23 .13	16.7 0.3	43.85 .09	51.5 2.0	47.50 .07	16.7 2.5	23.47 .06	51.7 2.4
July 8.0	37.38 .17	17.0 0.3	43.96 .13	49.5 2.0	47.59 .11	14.2 2.5	23.55 .10	49.3 2.4
18.0	37.56 .20	17.4 0.3	44.11 .16	47.5 2.0	47.71 .14	11.7 2.5	23.67 .13	46.9 2.4
27.9	37.77 .23	17.7 0.3	44.28 .19	45.6 1.9	47.87 .18	9.3 2.4	23.82 .17	44.6 2.3
Aug. 6.9	38.01 .25	18.0 0.3	44.49 .22	43.8 1.7	48.06 .21	7.0 2.2	24.00 .20	42.5 2.1
16.9	38.27 .27	18.2 0.2	44.72 .24	42.3 1.4	48.29 .24	5.0 1.9	24.22 .23	40.5 1.8
26.8	38.54 .29	18.4 +0.1	44.97 .26	41.0 1.1	48.54 .26	3.3 1.5	24.46 .25	38.9 1.5
Sept. 5.8	38.84 .30	18.4 0.0	45.24 .28	40.1 0.7	48.81 .28	2.0 1.1	24.72 .27	37.6 1.0
15.8	39.14 .31	18.3 −0.2	45.52 .29	39.6 +0.3	49.10 .30	1.2 0.6	25.00 .29	36.8 0.6
25.8	39.45 .32	18.1 0.3	45.81 .30	39.5 −0.1	49.41 .31	0.9 +0.1	25.30 .31	36.5 +0.1
Oct. 5.7	39.77 .32	17.8 0.4	46.11 .30	39.9 0.6	49.73 .32	1.1 −0.5	25.61 .32	36.7 −0.4
15.7	40.09 .32	17.3 0.5	46.42 .30	40.7 1.0	50.05 .32	1.8 1.0	25.93 .32	37.4 1.0
25.7	40.41 .31	16.7 0.6	46.72 .30	41.9 1.4	50.37 .32	3.1 1.5	26.25 .32	38.6 1.5
Nov. 4.7	40.72 .30	16.0 0.7	47.01 .29	43.5 1.8	50.68 .30	4.9 2.0	26.56 .31	40.2 1.9
14.6	41.01 .29	15.3 0.8	47.28 .27	45.5 2.1	50.97 .28	7.0 2.4	26.86 .29	42.3 2.3
24.6	41.29 .26	14.5 0.8	47.54 .24	47.7 2.3	51.24 .26	9.6 2.7	27.14 .27	44.8 2.6
Dec. 4.6	41.54 .23	13.8 0.7	47.77 .21	50.1 2.5	51.48 .22	12.4 2.9	27.39 .23	47.5 2.8
14.5	41.75 .19	13.1 0.7	47.96 .17	52.6 2.5	51.69 .18	15.4 3.0	27.60 .19	50.4 2.9
24.5	41.92 .15	12.5 0.6	48.11 .13	55.2 2.5	51.85 .13	18.4 3.0	27.77 .15	53.3 3.0
34.5	42.05 +.11	12.0 −0.5	48.22 −.08	57.7 −2.4	51.96 +.09	21.4 −3.0	27.89 +.10	56.3 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Geminorum.		* Piazzi vii. 67.		α Geminorum. (*Castor.*)		α Canis Minoris. (*Procyon.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 12	° ′ +22 12	h m 7 18	° ′ +68 42	h m 7 26	° ′ +32 9	h m 7 32	° ′ +5 32
	s	″	s	″	s	″	s	″
(Dec. 30.5)	48.50 +.17	30.8 −0.2	8.84 +.34	51.4 +2.3	46.80 +.20	26.3 +0.3	53.52 +.17	24.0 −1.4
Jan. 9.5	48.65 .12	30.6 −0.1	9.12 .28	53.8 2.5	46.98 .15	26.7 0.5	53.67 .13	22.6 1.3
19.5	48.74 .07	30.5 0.0	9.27 +.09	56.3 2.5	47.10 .09	27.2 0.6	53.77 .06	21.4 1.1
29.5	48.78 +.01	30.6 +0.1	9.30 −.04	58.8 2.5	47.16 +.03	27.8 0.7	53.82 +.03	20.5 0.9
Feb. 8.4	48.77 −.04	30.8 0.2	9.20 .16	61.3 2.3	47.16 −.03	28.6 0.8	53.82 −.02	19.6 0.7
18.4	48.71 .08	31.0 0.3	9.98 .27	63.5 2.1	47.11 .08	29.3 0.8	53.77 .07	19.0 0.5
28.4	48.61 .12	31.3 0.3	8.66 .36	65 4 1.8	47.01 .12	30.1 0.7	53.68 .10	18.6 0.4
Mar. 10.3	48.47 .15	31.6 0.3	8.26 .43	67.0 1.4	46.87 .15	30.7 0.6	53 57 .13	18.3 0.2
20.3	48.31 .16	31.9 0.3	7.81 .48	68.1 0.9	46.70 .18	31.3 0.5	53.42 .15	18.1 −0.1
30.3	48.15 .17	32.1 0.2	7.32 .50	68.8 +0.4	46.52 .19	31.7 0.4	53.27 .16	18.1 0.0
Apr. 9.3	47.98 .17	32.3 0.1	6.82 .50	69.0 −0.1	46.33 .19	32.0 +0.2	53.11 .16	18.2 +0.2
19.2	47.82 .15	32.4 +0.1	6.33 .47	68.6 0.6	46.15 .17	32.1 0.0	52.96 .15	18.4 0.3
29.2	47.68 .13	32.4 0.0	5.89 .42	67.8 1.0	45.99 .15	32.0 −0.2	52.82 .13	18.7 0.4
May 9.2	47.56 .10	32.4 0.0	5.51 .35	66.6 1.4	45.86 .12	31.8 0.3	52.70 .10	19.1 0.4
19.1	47.48 .06	32.4 −0.1	5.19 .27	65.0 1.8	45.76 .08	31.5 0.4	52.61 .07	19.6 0.5
29.1	47.44 −.02	32.3 0.1	4.97 .16	63.0 2.1	45.69 −.04	31.0 0.5	52.55 .04	20.1 0.6
June 8.1	47.44 +.02	32.2 0.1	4.84 −.06	60.8 2.3	45.67 .00	30.4 0.6	52.53 −.01	20.7 0.7
18.1	47.47 .06	32.0 0.1	4.81 +.02	58.4 2.5	45.69 +.04	29.7 0.7	52.54 +.03	21.4 0.7
28.0	47.55 .09	31.9 0.2	4.88 .12	55.8 2.6	45.76 .08	29.0 0.8	52.59 .06	22.1 0.7
July 8.0	47.66 .13	31.8 0.2	5.05 .22	53.2 2.6	45.86 .12	28.2 0.8	52.67 .10	22.9 0.7
18.0	47.81 .17	31.6 0.2	5.32 .31	50.6 2.6	46.00 .16	27.4 0.8	52.78 .13	23.6 0.7
28.0	47.99 .20	31.4 0.2	5.68 .40	48.0 2.5	46.18 .20	26.6 0.8	52.92 .16	24.2 0.6
Aug. 6.9	48.20 .22	31.2 0.2	6.11 .48	45.5 2.4	46.39 .23	25.8 0.9	53.09 .18	24.8 0.5
16.9	48.44 .25	30.9 0.3	6.63 .55	43.2 2.2	46.64 .26	24.9 0.9	53.29 .21	25.3 0.4
26.9	48.70 .27	30.6 0.4	7.21 .61	41.0 2.0	46.91 .28	24.1 0.9	53.51 .23	25.6 +0.2
Sept. 5.9	48.98 .29	30.2 0.4	7.85 .67	39.1 1.8	47.20 .30	23.2 0.9	53.75 .25	25.7 0.0
15.8	49.27 .31	29.7 0.5	8.54 .71	37.5 1.5	47.51 .33	22.3 0.9	54.02 .27	25.6 −0.2
25.8	49.59 .32	29.1 0.6	9.27 .75	36.2 1.2	47.85 .34	21.4 0.9	54.30 .29	25.3 0.5
Oct. 5.8	49.91 .33	28.5 0.7	10.03 .77	35.2 0.8	48.20 .36	20.5 0.9	54.59 .30	24.7 0.7
15.7	50.24 .34	27.7 0.8	10.81 .78	34.6 −0.4	48.56 .36	19.7 0.6	54.89 .31	23.9 1.0
25.7	50.58 .34	27.0 0.8	11.59 .78	34.4 0.0	48.92 .37	18.9 0.8	55.20 .32	22.8 1.2
Nov. 4.7	50.92 .33	26.1 0.8	12.37 .76	34.5 +0.4	49.29 .37	18.2 0.7	55.52 .31	21.6 1.4
14.7	51.24 .32	25.3 0.8	13.11 .73	35.1 0.8	49.65 .36	17.6 0.6	55.83 .31	20.1 1.5
24.6	51.56 .31	24.6 0.7	13.81 .68	36.1 1.2	50.00 .34	17.1 0.4	56.13 .29	18.6 1.6
Dec. 4.6	51.85 .28	23.9 0.6	14.46 .61	37.5 1.6	50.33 .31	16.8 −0.2	56.41 .27	17.0 1.6
14.6	52.11 .24	23.3 0.5	15.02 .52	39.2 1.9	50.62 .28	16.6 0.0	56.66 .24	15.4 1.6
24.6	52.33 .20	22.9 0.4	15.48 .41	41.3 2.2	50.88 .23	16.7 +0.2	56.87 .20	13.9 1.5
34.5	52.51 +.16	22.6 −0.2	15.83 +.30	43.6 +2.4	51.09 +.18	17.0 +0.3	57.05 +.15	12.5 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Geminorum. (*Pollux.*)		φ Geminorum.		*3 Ursæ Majoris (H.)		15 Argus (ι)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 7 37	° ′ +28 19	h m 7 45	° ′ +27 4	h m 8 0	° ′ +68 49	h m 8 2	° ′ −23 56
	s	″	s	″	s	″	s	″
(Dec. 30.5)	49.27 +.21	21.2 0.0	60.10 +.21	59.6 −0.1	37.95 +.45	58.3 +2.1	19.96 +.18	54.3 −2.9
Jan. 9.5	49.45 .15	21.3 +0.2	60.29 .16	59.6 +0.1	38.33 .33	60.5 2.3	20.12 .13	57.2 2.9
19.5	49.57 .10	21.6 0.3	60.42 .11	59.8 0.3	38.60 .20	62.9 2.5	20.22 .08	60.0 2.8
29.5	49.64 +.04	22.0 0.5	60.50 +.05	60.1 0.4	38.73 +.07	65.5 2.6	20.27 +.03	62.7 2.5
Feb. 8.4	49.65 −.02	22.5 0.6	60.52 −.01	60.6 0.5	38.74 −.06	68.0 2.5	20.27 −.03	65.1 2.3
18.4	49.61 .07	23.1 0.6	60.48 .06	61.1 0.6	38.62 .18	70.5 2.4	20.22 .07	67.2 2.0
28.4	49.51 .11	23.7 0.6	60.40 .10	61.7 0.6	38.38 .29	72.7 2.1	20.13 .11	69.0 1.7
Mar. 10.3	49.39 .14	24.3 0.6	60.29 .14	62.2 0.6	38.05 .37	74.7 1.8	20.00 .15	70.5 1.3
20.3	49.23 .17	24.8 0.5	60.14 .16	62.8 0.5	37.64 .44	76.3 1.4	19.85 .17	71.7 1.0
30.3	49.06 .18	25.2 0.4	59.97 .17	63.2 0.4	37.18 .48	77.5 0.9	19.67 .18	72.4 0.6
Apr. 9.3	48.88 .18	25.6 0.3	59.80 .17	63.6 0.3	36.69 .50	78.1 +0.5	19.49 .18	72.8 −0.2
19.2	48.71 .17	25.8 +0.1	59.63 .16	63.8 +0.2	36.20 .49	78.3 0.0	19.31 .18	72.9 +0.1
29.2	48.55 .15	25.8 0.0	59.48 .14	63.9 0.0	35.72 .46	78.1 −0.5	19.13 .17	72.6 0.5
May 9.2	48.42 .12	25.7 −0.1	59.35 .12	63.9 −0.1	35.29 .41	77.3 1.0	18.98 .15	71.9 0.8
19.2	48.32 .09	25.5 0.2	59.24 .09	63.8 0.2	34.91 .34	76.1 1.4	18.84 .12	70.9 1.1
29.1	48.25 .05	25.2 0.3	59.17 .05	63.6 0.3	34.60 .27	74.4 1.8	18.73 .09	69.6 1.4
June 8.1	48.23 −.01	24.9 0.4	59.14 −.01	63.3 0.4	34.38 .18	72.5 2.1	18.66 .06	68.1 1.7
18.1	48.24 +.03	24.4 0.5	59.15 +.03	62.9 0.4	34.25 −.09	70.2 2.4	18.61 −.03	66.3 1.9
28.0	48.29 .07	23.9 0.6	59.19 .06	62.4 0.5	34.21 +.01	67.7 2.6	18.60 +.01	64.4 2.0
July 8.0	48.38 .11	23.3 0.6	59.27 .10	61.9 0.5	34.27 .11	65.1 2.7	18.63 .04	62.3 2.1
18.0	48.51 .15	22.7 0.6	59.39 .14	61.3 0.6	34.42 .23	62.3 2.8	18.69 .08	60.2 2.1
28.0	48.67 .18	22.1 0.7	59.55 .17	60.7 0.6	34.67 .29	59.5 2.8	18.78 .11	58.1 2.1
Aug. 6.9	48.87 .21	21.4 0.7	59.73 .20	60.1 0.7	35.00 .38	56.8 2.8	18.91 .14	56.0 2.0
16.9	49.09 .24	20.7 0.8	59.95 .23	59.4 0.7	35.41 .45	54.1 2.6	19.07 .18	54.1 1.8
26.9	49.34 .26	19.9 0.8	60.19 .25	58.6 0.8	35.90 .53	51.5 2.5	19.26 .21	52.5 1.5
Sept. 5.9	49.61 .29	19.1 0.8	60.45 .28	57.8 0.8	36.46 .59	49.1 2.3	19.48 .23	51.2 1.2
15.8	49.91 .31	18.2 0.9	60.74 .30	56.9 0.9	37.08 .65	46.9 2.1	19.73 .26	50.2 0.8
25.8	50.23 .32	17.3 0.9	61.05 .32	56.0 1.0	37.76 .70	45.0 1.8	20.00 .28	49.7 +0.3
Oct. 5.8	50.56 .34	16.4 0.9	61.38 .33	55.1 1.0	38.48 .74	43.4 1.5	20.29 .30	49.6 −0.2
15.7	50.90 .35	15.5 0.9	61.72 .35	54.1 1.0	39.23 .77	42.1 1.1	20.60 .32	50.1 0.7
25.7	51.26 .36	14.5 0.9	62.07 .35	53.0 1.0	40.01 .78	41.2 0.7	20.92 .33	51.0 1.2
Nov. 4.7	51.61 .36	13.6 0.9	62.42 .36	52.1 1.0	40.79 .78	40.7 −0.3	21.25 .33	52.4 1.6
14.7	51.96 .35	12.8 0.8	62.78 .35	51.1 0.9	41.57 .77	40.7 +0.2	21.57 .32	54.3 2.1
24.6	52.30 .33	12.1 0.7	63.12 .34	50.3 0.8	42.32 .73	41.1 0.6	21.88 .31	56.5 2.4
Dec. 4.6	52.63 .31	11.5 0.5	63.44 .31	49.6 0.6	43.03 .68	41.9 1.1	22.18 .28	59.0 2.7
14.6	52.92 .28	11.1 0.3	63.74 .28	49.1 0.4	43.66 .60	43.2 1.5	22.44 .25	61.8 2.9
24.6	53.17 .23	10.9 −0.1	64.00 .24	48.7 −0.2	44.22 .51	44.9 1.8	22.67 .21	64.7 3.0
24.5	53.38 +.18	10.9 +0.1	64.22 +.19	48.7 +0.1	44.67 +.40	46.9 +2.1	22.86 +.16	67.7 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		ι Ursæ Majoris.		*σ² Ursæ Majoris.		κ Cancri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 8 40	° ′ +6 51	h m 8 50	° ′ +48 31	h m 8 59	° ′ +67 37	h m 9 1	° ′ +11 9
	s	″	s	″	s	″	s	″
(Dec. 30.6)	17.30 +.22	71.3 −1.5	49.27 +.34	17.9 +0.7	37.19 +.53	46.8 +1.5	6.55 +.26	45.0 −1.4
Jan. 9.5	17.51 .19	69.8 1.4	49.58 .28	18.8 1.0	37.69 .44	47.5 1.9	6.79 .21	43.7 1.2
19.6	17.67 .14	68.5 1.2	49.83 .21	20.0 1.3	38.07 .33	49.5 2.2	6.98 .17	42.6 1.0
29.5	17.79 .09	67.5 1.0	50.00 .14	21.4 1.5	38.35 .21	51.9 2.4	7.12 .12	41.8 0.7
Feb. 8.5	17.86 +.04	66.6 0.7	50.11 +.07	23.0 1.7	38.50 +.09	54.4 2.6	7.21 .06	41.1 0.5
18.4	17.87 −.01	66.0 0.5	50.13 −.01	24.7 1.8	38.52 −.03	56.9 2.6	7.24 +.01	40.7 0.3
28.4	17.84 .05	65.5 0.4	50.09 .07	26.5 1.7	38.43 .15	59.4 2.5	7.23 −.03	40.5 −0.1
Mar. 10.4	17.77 .09	65.3 −0.2	49.99 .13	28.2 1.6	38.24 .25	61.8 2.3	7.18 .07	40.5 0.0
20.4	17.67 .11	65.2 0.0	49.84 .18	29.7 1.5	37.95 .33	63.9 2.0	7.10 .10	40.6 +0.2
30.3	17.55 .12	65.3 +0.1	49.64 .21	31.1 1.2	37.58 .39	65.7 1.6	6.98 .12	40.8 0.3
Apr. 9.3	17.41 .14	65.4 0.2	49.42 .23	32.2 0.9	37.17 .43	67.1 1.1	6.86 .14	41.1 0.3
19.3	17.27 .14	65.7 0.3	49.19 .23	32.9 0.6	36.72 .45	68.0 0.7	6.72 .14	41.5 0.4
29.3	17.13 .14	66.0 0.4	48.96 .23	33.4 +0.3	36.27 .45	68.4 +0.2	6.58 .13	41.8 0.4
May 9.2	17.00 .12	66.4 0.4	48.74 .21	33.5 −0.1	35.82 .43	68.4 −0.3	6.45 .12	42.2 0.4
19.2	16.89 .10	66.8 0.5	48.54 .19	33.2 0.4	35.41 .39	67.8 0.8	6.34 .11	42.7 0.4
29.2	16.80 .08	67.3 0.5	48.37 .15	32.6 0.7	35.04 .34	66.8 1.2	6.24 .09	43.1 0.4
June 8.1	16.74 .05	67.8 0.5	48.24 .11	31.7 1.0	34.73 .28	65.4 1.7	6.17 .06	43.4 0.4
18.1	16.70 −.02	68.4 0.5	48.15 .07	30.6 1.3	34.49 .20	63.5 2.0	6.12 .03	43.8 0.4
28.1	16.70 +.01	68.9 0.5	48.11 −.02	29.1 1.6	34.33 .12	61.4 2.3	6.10 −.01	44.1 0.3
July 8.1	16.72 .04	69.4 0.5	48.11 +.03	27.5 1.7	34.24 −.05	58.9 2.6	6.11 +.02	44.4 0.2
18.0	16.77 .07	69.9 0.5	48.16 .07	25.7 1.9	34.24 +.04	56.2 2.8	6.15 .05	44.6 0.2
28.0	16.86 .10	70.3 0.4	48.25 .12	23.7 2.0	34.32 .12	53.4 2.9	6.21 .08	44.8 +0.1
Aug. 7.0	16.96 .13	70.7 0.3	48.39 .16	21.6 2.1	34.48 .20	50.5 3.0	6.30 .11	44.8 0.0
17.0	17.10 .15	70.9 +0.2	48.56 .20	19.5 2.2	34.73 .28	47.5 3.0	6.43 .14	44.7 −0.2
26.9	17.27 .18	71.0 0.0	48.79 .24	17.3 2.2	35.05 .36	44.5 3.0	6.57 .16	44.5 0.3
Sept. 5.9	17.46 .21	70.9 −0.2	49.05 .28	15.1 2.2	35.44 .43	41.5 2.9	6.75 .19	44.1 0.5
15.9	17.68 .23	70.5 0.4	49.35 .32	12.9 2.2	35.91 .50	38.7 2.7	6.96 .22	43.5 0.7
25.8	17.92 .26	70.0 0.7	49.69 .36	10.8 2.1	36.44 .56	36.1 2.5	7.19 .25	42.7 0.9
Oct. 5.8	18.19 .28	69.2 0.9	50.06 .39	8.8 1.9	37.04 .62	33.7 2.3	7.45 .27	41.7 1.1
15.8	18.48 .30	68.2 1.1	50.47 .42	6.9 1.8	37.68 .67	31.6 2.0	7.73 .29	40.6 1.3
25.8	18.78 .31	67.0 1.3	50.90 .44	5.3 1.6	38.38 .71	29.8 1.6	8.04 .31	39.2 1.5
Nov. 4.7	19.10 .32	65.5 1.5	51.35 .46	3.8 1.3	39.10 .73	28.4 1.2	8.36 .32	37.6 1.6
14.7	19.43 .33	63.9 1.7	51.81 .46	2.6 1.0	39.83 .74	27.4 0.7	8.69 .33	36.0 1.7
24.7	19.75 .32	62.2 1.8	52.27 .46	1.8 0.7	40.57 .73	26.9 −0.3	9.02 .33	34.3 1.7
Dec. 4.7	20.07 .31	60.5 1.8	52.72 .44	1.3 −0.3	41.30 .71	26.9 +0.2	9.35 .32	32.6 1.7
14.6	20.37 .29	58.7 1.7	53.15 .41	1.1 +0.1	41.98 .66	27.4 0.7	9.67 .31	30.9 1.6
24.6	20.64 .26	57.0 1.6	53.54 .37	1.4 0.4	42.61 .59	28.3 1.2	9.96 .28	29.3 1.5
34.6	20.88 +.23	55.5 −1.5	53.89 +.33	2.0 +0.8	43.15 +.50	29.8 +1.6	10.22 +.24	27.9 −1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Argus.		*1 Draconis (H.)		α Hydræ.		*d Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 13	° ′ −58 45	h m 9 19	° ′ +81 51	h m 9 21	° ′ −8 7	h m 9 23	° ′ +70 21
	s	″	s	″	s	″	s	″
(Dec. 30.6)	49.27 +.32	17.3 −3.6	35.34 +1.36	53.7 +1.8	33.88 +.26	30.1 −2.3	39.16 +.64	59.0 +1.4
Jan. 9.6	49.56 .25	21.0 3.8	36.58 1.12	55.7 2.2	34.11 .22	32.4 2.3	30.75 .54	60.5 1.6
19.6	49.76 .16	24.8 3.9	37.57 .85	58.2 2.6	34.31 .17	34.6 2.1	40.24 .42	62.5 2.2
29.5	49.88 +.08	28.7 3.9	38.27 .55	60.9 2.8	34.46 .12	36.7 2.0	40.60 .29	64.8 2.5
Feb 8.5	49.92 .00	32.5 3.8	38.66 +.23	63.8 3.0	34.56 .07	38.5 1.7	40.82 .16	67.4 2.6
18.5	49.88 −.08	36.2 3.6	38.73 −.08	66.8 3.0	34.61 +.03	40.1 1.5	40.91 +.02	70.1 2.7
28.4	49.76 .15	39.6 3.3	38.50 .39	69.7 2.9	34.61 −.02	41.5 1.2	40.86 −.11	72.7 2.6
Mar. 10.4	49.58 .22	42.8 3.0	37.97 .66	72 5 2.7	34.57 .06	42.6 1.0	40.68 .23	75.3 2.5
20.4	49.33 .27	45.5 2.6	37.19 .90	75.0 2.3	34.49 .09	43.4 0.7	40.40 .33	77.6 2.2
30.4	49.04 .31	47.9 2.2	36.19 1.09	77.1 1.9	34.39 .11	44.0 0.5	40.02 .42	79.7 1.9
Apr. 9.3	48.72 .34	49.8 1.7	35.02 1.23	78.7 1.4	34.27 .13	44.4 −0.2	39.57 .47	81.3 1.4
19.3	48.38 .35	51.2 1.2	33.74 1.32	79.8 0.8	34.14 .13	44.5 0.0	39.08 .51	82.6 1.0
29.3	48.02 .36	52.1 0.7	32.40 1.35	80.4 +0.3	34.00 .13	44.4 +0.2	38.56 .52	83.3 +0.5
May 9.3	47.67 .35	52.5 −0.1	31.05 1.34	80.4 −0.2	33.87 .13	44.1 0.4	38.04 .51	83.5 −0.1
19.2	47.32 .34	52.4 +0.4	29.74 1.27	79.8 0.9	33.75 .12	43.6 0.6	37.55 .48	83.2 0.6
29.2	46.99 .32	51.8 0.9	28.53 1.16	78.6 1.4	33.65 .10	43.0 0.7	37.09 .43	82.3 1.1
June 8.2	46.69 .29	50.7 1.4	27.44 1.01	77.0 1.9	33.56 .08	42.2 0.9	36.69 .37	81.1 1.5
18.1	46.42 .25	49.1 1.8	26.51 .84	74.9 2.3	33.49 .06	41.3 1.0	36.35 .30	79.4 1.9
28.1	46 20 .20	47.1 2.2	25.77 .64	72.4 2.7	33.45 .03	40.2 1.1	36.09 .22	77.3 2.3
July 8.1	46.02 .15	44.8 2.5	25.24 .42	69.6 3.0	33.43 −.01	39.1 1.1	35.92 .13	74.8 2.6
18.1	45.90 .09	42.2 2.7	24.93 −.20	66.5 3.2	33.44 +.02	36.0 1.2	35.84 −.04	72.1 2.8
28.0	45.83 −.03	39.4 2.9	24.85 +.03	63.2 3.4	33.47 .05	36.9 1.1	35.84 +.05	69.2 3.0
Aug. 7.0	45.83 +.03	36.5 3.0	25.00 .26	59.8 3.5	33.53 .08	35.8 1.1	35.94 .15	66.1 3.1
17.0	45.90 .10	33.5 2.9	25.37 .49	56.3 3.5	33.62 .11	34.8 0.9	36.13 .24	63.0 3.2
27.0	46.03 .16	30.7 2.8	25.97 .71	52.8 3.4	33.74 .12	33.9 0.7	36.41 .33	59.8 3.2
Sept. 5.9	46.22 .23	28.0 2.5	26.79 .92	49.4 3.3	33.89 .16	33.3 0.5	36.78 .41	56.6 3.1
15.9	46.49 .30	25.7 2.2	27.81 1.12	46.2 3.2	34.07 .19	33 0 +0.2	37.24 .50	53.5 3.0
25.9	46.81 .36	23.7 1.7	29.03 1.30	43.2 2.9	34.28 .22	32.9 −0.1	37.77 .57	50.6 2.8
Oct. 5.8	47.20 .41	22.3 1.2	30.41 1.46	40.4 2.6	34.52 .25	33.2 0.4	38.38 .65	47.9 2.6
15.8	47.63 .46	21.4 +0.6	31.94 1.60	38.0 2.2	34.78 .28	33.8 0.8	39.06 .71	45.4 2.3
25.8	48.10 .49	21.2 −0.1	33.60 1.71	36.0 1.8	35.07 .30	34.8 1.2	39.80 .76	43.3 1.9
Nov. 4.8	48.60 .51	21.5 0.7	35.35 1.79	34.5 1.3	35.38 .32	36.1 1.5	40.57 .80	41.6 1.5
14.7	49.11 .51	22.6 1.4	37.16 1.82	33.5 0.8	35.71 .33	37.8 1.8	41.38 .82	40.3 1.0
24.7	49.61 .50	24.2 2.0	38.98 1.81	33.0 −0.2	36.04 .33	39.7 2.0	42.20 .82	39.5 −0.5
Dec. 4.7	50.09 .47	26.5 2.5	40.76 1.75	33.1 +0.4	36.36 .32	41.8 2.2	43.02 .80	39.3 0.0
14.7	50.54 .42	29.3 3.0	42.45 1.64	33.7 0.9	36.68 .30	44.1 2.3	48.80 .76	30.5 +0.5
24.6	50.93 .36	32.5 3.4	44.01 1.47	34.9 1.5	36.97 .28	46.4 2.4	44.53 .69	40.3 1.0
34.6	51.26 +.29	36.0 −3.6	45.38 +1.26	36.7 +2.0	37.23 +.24	48.8 −2.3	45.18 +.60	41.6 +1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Ursæ Majoris.		ε Leonis.		μ Leonis.		α Leonis. (*Regulus.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 24	° ′ +52 13	h m 9 38	° ′ +24 20	h m 9 45	° ′ +26 34	h m 10 1	° ′ +12 33
	s	″	s	″	s	″	s	″
(Dec. 30.6)	39.82 +.40	63.9 +0.6	53.66 +.31	19.3 −1.0	47.51 +.32	62.5 −0.8	50.57 +.29	62.0 −1.6
Jan. 9.6	40.19 .34	64.7 1.0	53.94 .27	18.5 0.6	47.80 .27	61.9 0.5	50.85 .27	60.6 1.4
19.6	41.49 .27	65.8 1.3	54.18 .22	18.0 −0.3	48.05 .23	61.5 −0.2	51.09 .22	59.3 1.1
29.5	41.73 .20	67.3 1.6	54.37 .17	17.8 0.0	48.25 .17	61.4 +0.1	51.29 .18	58.4 0.8
Feb. 8.5	40.88 .12	69.0 1.8	54.51 .11	17.9 +0.2	48.40 .12	61.6 0.4	51.44 [illegible]	57.7 0.6
18.5	40.96 +.04	70.9 2.0	54.60 +.06	18.3 0.5	48.49 .06	62.1 0.6	51.54 .08	57.3 0.3
28.4	40.96 −.04	72.9 2.0	54.63 00	18.8 0.6	48.53 +.01	62.8 0.8	51.59 +.03	57.1 −0.1
Mar. 10.4	40.89 .10	74.9 1.9	54.61 −.04	19.5 0.8	48.52 −.03	63.6 0.9	51.60 −.02	57.1 +0.1
20.4	40.75 .16	76.7 1.8	54.55 .08	20.3 0.8	48.46 .07	64.5 0.9	51.56 .05	57.3 0.3
30.4	40.57 .20	78.4 1.6	54.45 .11	21.1 0.8	48.37 .11	65.4 1.0	51.50 .08	57.7 0.4
Apr. 9.3	40.35 .23	79.9 1.3	54.34 .13	22.0 0.8	48.25 .13	66.4 0.9	51.40 .10	58.1 0.5
19.3	40.11 .25	81.0 1.0	54.20 .14	22.7 0.7	48.12 .14	67.2 0.8	51.29 .12	58.6 0.5
29.3	39.86 .25	81.8 0.6	54.06 .14	23.4 0.6	47.98 .14	68.0 0.7	51.17 .12	59.2 0.5
May 9.3	39.61 .24	82.2 +0.2	53.92 .14	24.0 0.5	47.83 .14	68.6 0.5	51.05 .12	59.7 0.5
19.2	39.38 .22	82.1 −0.2	53.79 .13	24.4 0.4	47.70 .13	69.0 0.4	51.93 .11	60.2 0.5
29.2	39.17 .20	81.8 0.6	53.67 .11	24.7 +0.2	47.58 .11	69.3 +0.2	50.83 .10	60.7 0.5
June 8.2	38.99 .16	81.0 0.9	53.57 .09	24.8 0.0	47.47 .09	69.4 0.0	50.73 .09	61.1 0.4
18.1	38.84 .12	79.9 1.3	53.50 .06	24.8 −0.1	47.39 .07	69.3 −0.2	50.65 .07	61.5 0.3
28.1	38.74 .08	78.5 1.6	53.45 .04	24.6 0.3	47.33 .05	69.1 0.4	50.60 .05	61.8 0.3
July 8.1	38.69 −.03	76.8 1.8	53.43 −.01	24.2 0.4	47.30 −.02	68.6 0.5	50.56 −.03	62.0 +0.2
18.1	38.68 +.02	74.8 2.1	53.43 +.02	23.7 0.6	47.30 +.01	68.0 0.7	50.54 .00	62.1 0.0
28.0	38.71 .06	72.7 2.3	53.46 .05	23.1 0.7	47.32 .04	67.2 0.8	50.55 +.02	62.0 −0.1
Aug. 7.0	38.80 .11	70.3 2.4	53.52 .08	22.3 0.9	47.38 .07	66.3 1.0	50.59 .05	61.9 0.2
17.0	38.93 .15	67.9 2.5	53.61 .11	21.4 1.0	47.46 .10	65.2 1.2	50.65 .07	61.6 0.4
27.0	39.11 .20	65.4 2.6	53.73 .14	20.3 1.2	47.57 .13	64.0 1.3	50.74 .10	61.2 0.5
Sept. 5.9	39.33 .25	62.8 2.6	53.88 .17	19.0 1.3	47.72 .16	62.6 1.5	50.85 .13	60.6 0.7
15.9	39.60 .29	60.2 2.6	54.07 .20	17.6 1.5	47.90 .19	61.1 1.6	51.00 .17	59.7 0.9
25.9	39.92 .34	57.7 2.5	54.28 .23	16.1 1.6	48.11 .23	59.4 1.7	51.18 .20	58.7 1.1
Oct. 5.8	40.28 .38	55.3 2.4	54.53 .26	14.4 1.7	48.35 .26	57.6 1.8	51.40 .23	57.5 1.3
15.8	40.68 .42	53.0 2.2	54.81 .29	12.7 1.8	48.63 .29	55.7 1.9	51.64 .26	56.0 1.5
25.8	41.11 .45	50.8 2.0	55.11 .32	10.9 1.8	48.93 .32	53.8 1.9	51.92 .29	54.4 1.7
Nov. 4.8	41.57 .47	49.0 1.7	55.44 .34	9.0 1.9	49.26 .34	51.9 1.9	52.22 .31	52.7 1.8
14.7	42.05 .49	47.4 1.4	55.79 .36	7.2 1.8	49.61 .36	50.0 1.9	52.54 .33	50.8 1.9
24.7	42.54 .49	46.2 1.0	56.15 .36	5.4 1.7	49.98 .37	48.2 1.7	52.88 .34	48.8 2.0
Dec. 4.7	43.03 .48	45.4 0.6	56.51 .36	3.8 1.6	50.35 .37	46.6 1.6	53.22 .34	46.9 1.9
14.7	43.50 .46	45.0 −0.2	56.86 .35	2.3 1.3	50.71 .35	45.2 1.3	53.56 .33	45.0 1.9
24.6	43.95 .42	45.1 +0.3	57.20 .32	1.1 1.1	51.05 .33	44.0 1.1	53.88 .32	43.2 1.7
34.6	44.35 +.37	45.6 +0.7	57.50 +.29	0.1 −0.9	51.36 +.29	43.1 −0.7	54.19 +.29	41.6 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*32 Ursæ Majoris		γ¹ Leonis.		*9 Draconis (H.)		ρ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 10 9	° ′ +65 42	h m 10 13	° ′ +20 27	h m 10 24	° ′ +76 20	h m 10 26	° ′ +9 55
	s	″	s	″	s	″	s	″
(Dec. 30.6)	8.41 +.60	61.1 +0.7	12.72 +.32	42.8 −1.3	41.39 +.99	27.8 +0.9	21.25 +.31	77.7 −1.8
Jan. 9.6	8.98 .53	62.0 1.2	13.02 .28	41.7 1.0	42.34 .89	28.9 1.4	21.54 .28	76.0 1.6
19.6	9.47 .45	63.4 1.6	13.28 .24	40.8 0.7	43.16 .75	30.6 1.9	21.80 .24	74.5 1.3
29.6	9.87 .36	65.2 2.0	13.50 .20	40.3 0.4	43.83 .59	32.7 2.3	22.02 .20	73.3 1.1
Feb. 8.5	10.17 .24	67.4 2.3	13.67 .14	40.0 −0.1	44.34 .42	35.1 2.6	22.19 .15	72.4 0.8
18.5	10.35 .13	69.8 2.5	13.79 .09	40.0 +0.2	44.67 .23	37.9 2.8	22.32 .10	71.8 0.5
28.5	10.42 +.02	72.4 2.6	13.85 +.04	40.3 0.4	44.80 +.04	40.7 2.9	22.39 .05	71.4 −0.3
Mar. 10.5	10.39 −.09	75.0 2.6	13.87 .00	40.8 0.6	44.75 −.14	43.6 2.9	22.42 +.01	71.3 0.0
20.4	10.26 .18	77.5 2.4	13.85 −.04	41.5 0.7	44.53 .31	46.4 2.7	22.41 −.03	71.4 +0.2
30.4	10.03 .26	79.8 2.2	13.79 .08	42.2 0.8	44.15 .45	49.0 2.5	22.37 .06	71.6 0.3
Apr. 9.4	9.74 .32	81.9 1.9	13.70 .10	43.0 0.8	43.63 .57	51.3 2.1	22.29 .09	72.0 0.4
19.3	9.40 .37	83.6 1.5	13.59 .12	43.8 0.8	43.01 .67	53.2 1.6	22.20 .10	72.4 0.5
29.3	9.01 .39	84.8 1.0	13.47 .12	44.6 0.7	42.31 .73	54.6 1.2	22.09 .11	73.0 0.5
May 9.3	8.62 .40	85.6 0.6	13.34 .12	45.3 0.7	41.56 .76	55.5 0.7	21.98 .11	73.5 0.6
19.3	8.22 .40	85.9 +0.1	13.22 .12	45.9 0.5	40.80 .77	55.9 +0.1	21.87 .11	74.1 0.6
29.2	7.83 .37	85.8 −0.4	13.10 .11	46.3 0.4	40.04 .74	55.7 −0.5	21.77 .10	74.6 0.5
June 8.2	7.47 .34	85.1 0.9	13.00 .10	46.6 0.3	39.32 .70	54.9 1.0	21.67 .09	75.1 0.5
18.2	7.16 .30	84.0 1.3	12.92 .08	46.8 +0.1	38.65 .63	53.7 1.5	21.58 .08	75.5 0.4
28.2	6.89 .24	82.4 1.8	12.85 .06	46.9 0.0	38.06 .55	52.0 2.0	21.51 .06	75.9 0.4
July 8.1	6.67 .18	80.5 2.2	12.80 .04	46.8 −0.2	37.56 .45	49.8 2.4	21.46 .04	76.3 0.3
18.1	6.52 .12	78.2 2.5	12.78 −.01	46.5 0.4	37.17 .34	47.2 2.7	21.43 −.02	76.5 0.2
28.1	6.43 −.05	75.6 2.7	12.78 +.01	46.1 0.5	36.88 .22	44.3 3.0	21.42 .00	76.6 +0.1
Aug. 7.0	6.42 +.02	72.7 3.0	12.80 .04	45.5 0.7	36.72 −.10	41.2 3.3	31.43 +.02	76.6 −0.1
17.0	6.47 .09	69.7 3.1	12.85 .07	44.7 0.8	36.69 +.03	37.8 3.5	21.47 .05	76.4 0.2
27.0	6.59 .16	66.5 3.2	12.93 .10	43.8 1.0	36.78 .16	34.3 3.6	21.53 .08	76.1 0.4
Sept. 6.0	6.79 .23	63.2 3.3	13.05 .13	42.7 1.2	37.00 .29	30.7 3.6	21.62 .11	75.6 0.6
15.9	7.06 .31	60.0 3.3	13.19 .16	41.4 1.4	37.36 .42	27.1 3.6	21.74 .14	74.8 0.8
25.9	7.40 .38	56.7 3.2	13.37 .19	39.9 1.6	37.84 .55	23.6 3.5	21.90 .17	73.9 1.0
Oct. 5.9	7.82 .45	53.6 3.0	13.58 .23	38.2 1.7	38.45 .67	20.2 3.3	22.09 .21	72.8 1.3
15.9	8.30 .51	50.7 2.8	13.82 .26	36.5 1.8	39.16 .78	17.0 3.0	22.32 .24	71.4 1.5
25.8	8.84 .57	48.0 2.5	14.10 .29	34.6 2.0	40.01 .89	14.2 2.7	22.58 .27	69.8 1.7
Nov. 4.8	9.43 .62	45.6 2.2	14.41 .32	32.6 2.0	40.95 .98	11.7 2.3	22.86 .30	68.0 1.9
14.8	10.07 .66	43.7 1.8	14.74 .34	30.5 2.0	41.96 1.05	9.6 1.8	23.18 .32	66.1 2.0
24.7	10.74 .68	42.1 1.3	15.09 .35	28.5 2.0	43.02 1.09	8.0 1.3	23.51 .34	64.1 2.0
Dec. 4.7	11.42 .68	41.1 0.8	15.44 .36	26.6 1.9	44.12 1.10	7.0 0.8	23.85 .34	62.0 2.1
14.7	12.10 .67	40.5 −0.3	15.79 .35	24.8 1.7	45.21 1.08	6.5 −0.2	24.19 .34	60.0 2.0
24.7	12.75 .63	40.6 +0.3	16.14 .33	23.2 1.5	46.27 1.03	6.7 +0.5	24.52 .32	68.0 1.8
34.6	13.35 +.57	41.1 +0.8	16.46 +.30	21.9 −1.2	47.27 +9.5	7.4 +1.0	24.84 +.30	56.2 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Argus. Right Ascension.	η Argus. Declination South.	ι Leonis. Right Ascension.	ι Leonis. Declination North.	α Ursæ Majoris Right Ascension.	α Ursæ Majoris Declination North.	δ Leonis. Right Ascension.	δ Leonis. Declination North.
	h m 10 40	° ′ −59 1	h m 10 42	° ′ +11 11	h m 10 56	° ′ +62 24	h m 11 7	° ′ +21 11
	s	″	s	″	s	″	s	″
(Dec. 30.7)	18.19 +.45	58.6 −2.9	48.54 +.32	41.1 −1.8	10.00 +.59	35.2 −0.1	35.06 +.35	42.9 −1.6
Jan. 9.6	18.62 .40	61.7 3.3	48.85 .29	39.4 1.6	10.56 .54	35.4 +0.5	35.39 .32	41.5 1.3
19.6	18.99 .34	65.2 3.6	49.12 .26	37.9 1.3	11.07 .47	36.2 1.0	35.69 .29	40.4 0.9
29.6	19.29 .26	68.8 3.7	49.35 .21	36.8 1.0	11.50 .40	37.5 1.5	35.96 .24	39.6 0.6
Feb. 8.6	19.51 .18	72.6 3.8	49.54 .16	35.9 0.7	11.86 .31	39.3 2.0	36.18 .20	39.2 −0.2
18.5	19.65 .10	76.4 3.8	49.68 .12	35.3 0.5	12.12 .21	41.4 2.3	36.35 .15	39.2 +0.1
28.5	19.72 +.03	80.2 3.7	49.78 .07	35.0 −0.2	12.28 .12	43.8 2.5	36.47 .10	39.4 0.4
Mar. 10.5	19.71 −.04	83.8 3.5	49.82 +.03	34.9 0.0	12.35 +.02	46.3 2.6	36.55 .05	40.0 0.6
20.5	19.63 .11	87.1 3.2	49.83 −.01	35.0 +0.2	12.33 −.07	48.9 2.6	36.58 +.01	40.7 0.8
30.4	19.50 .16	90.2 2.9	49.80 .05	35.4 0.4	12.22 .15	51.4 2.5	36.57 −.03	41.6 0.9
Apr. 9.4	19.31 .21	93.0 2.6	49.74 .07	35.8 0.5	12.04 .21	53.8 2.2	36.52 .06	42.6 1.0
19.4	19.06 .25	95.3 2.2	49.65 .09	36.4 0.6	11.79 .27	55.9 1.9	36.45 .08	43.6 1.0
29.3	18.82 .28	97.3 1.7	49.55 .10	37.0 0.6	11.51 .31	57.7 1.6	36.36 .10	44.6 1.0
May 9.3	18.53 .30	98.7 1.2	49.45 .11	37.6 0.6	11.19 .33	59.0 1.1	36.25 .11	45.5 0.9
19.3	18.23 .31	99.7 0.7	49.34 .11	38.2 0.6	10.85 .34	59.9 0.7	36.14 .11	46.4 0.8
29.3	17.92 .31	100.2 −0.2	49.24 .10	38.8 0.6	10.52 .34	60.4 +0.2	36.03 .11	47.1 0.6
June 8.2	17.61 .30	100.1 +0.3	49.14 .10	39.3 0.5	10.18 .32	60.4 −0.3	35.92 .11	47.7 0.5
18.2	17.31 .29	99.6 0.8	49.05 .09	39.7 0.4	9.87 .30	59.8 0.8	35.82 .10	48.1 0.3
28.2	17.03 .27	98.6 1.2	48.97 .07	40.1 0.3	9.59 .27	58.8 1.2	35.73 .09	48.2 +0.1
July 8.2	16.77 .24	97.2 1.7	48.91 .05	40.4 0.2	9.34 .23	57.3 1.7	35.64 .07	48.2 −0.1
18.1	16.55 .21	95.3 2.0	48.87 .03	40.5 +0.1	9.13 .18	55.5 2.0	35.58 .06	48.1 0.3
28.1	16.36 .16	93.1 2.4	48.84 −.01	40.6 0.0	8.97 .13	53.3 2.4	35.53 .04	47.7 0.5
Aug. 7.1	16.23 .11	90.7 2.6	48.84 +.01	40.5 −0.2	8.87 .08	50.7 2.7	35.51 −.02	47.1 0.7
17.0	16.15 −.05	88.0 2.7	48.86 .03	40.3 0.3	8.82 −.02	47.9 3.0	35.50 +.01	46.3 0.9
27.0	16.13 +.02	85.2 2.8	48.91 .06	39.9 0.5	8.82 +.04	44.9 3.2	35.52 .04	45.3 1.1
Sept. 6.0	16.19 .09	82.5 2.7	48.98 .09	39.3 0.7	8.89 .10	41.6 3.3	35.58 .07	44.0 1.3
16.0	16.31 .16	79.8 2.6	49.09 .12	38.4 0.9	9.03 .17	38.3 3.4	35.66 .10	42.6 1.5
25.9	16.51 .24	77.4 2.3	49.23 .16	37.4 1.1	9.23 .24	34.9 3.4	35.78 .14	41.0 1.7
Oct. 6.9	16.78 .31	75.3 1.9	49.41 .20	36.2 1.4	9.51 .31	31.5 3.4	35.94 .18	39.2 1.9
16.9	17.12 .37	73.6 1.5	49.62 .23	34.7 1.6	9.86 .38	28.2 3.2	36.13 .21	37.2 2.1
25.9	17.53 .43	72.4 0.9	49.86 .26	33.0 1.8	10.25 .44	25.1 3.0	36.37 .25	35.0 2.2
Nov. 4.8	17.99 .48	71.8 +0.3	50.14 .29	31.2 1.9	10.72 .50	22.2 2.8	36.64 .29	32.8 2.3
14.8	18.49 .52	71.8 −0.3	50.45 .32	29.2 2.0	11.24 .55	19.6 2.4	36.94 .32	30.5 2.3
24.8	19.01 .53	72.5 1.0	50.78 .34	27.1 2.1	11.81 .58	17.3 2.0	37.27 .34	28.2 2.3
Dec. 4.7	19.55 .54	73.7 1.6	51.12 .34	25.0 2.1	12.40 .61	15.6 1.5	37.62 .36	26.0 2.2
14.7	20.08 .52	75.6 2.1	51.46 .34	22.9 2.0	13.01 .61	14.4 1.0	37.98 .36	23.9 2.0
24.7	20.58 .49	78.0 2.7	51.80 .33	20.9 1.9	13.62 .60	13.7 0.4	38.33 .35	22.0 1.8
34.7	21.05 +.44	80.9 −3.1	52.12 +.31	19.1 −1.7	14.20 +.56	13.5 −0.2	38.68 +.34	20.4 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Crateris.		τ Leonis.		*λ Draconis.		υ Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 11 13	° ′ −14 6	h m 11 21	° ′ +3 31	h m 11 24	° ′ +69 59	h m 11 30	° ′ −0 8
	s	″	s	″	s	″	s	″
(Dec. 30.7)	12.23 +.33	43.7 −2.5	37.52 +.33	57.7 −2.1	7.95 +.77	73.9 −0.2	39.81 +.33	42.9 −2.2
Jan. 9.7	12.54 .30	46.2 2.5	37.84 .31	55.7 2.0	8.69 .72	74.0 +0.4	40.13 .31	45.1 2.1
19.6	12.83 .27	48.6 2.4	38.13 .28	53.8 1.8	9.38 .65	74.8 1.0	40.43 .28	47.1 1.9
29.6	13.08 .23	51.0 2.3	38.39 .24	52.1 1.5	9.98 .56	76.1 1.6	40.70 .25	48.9 1.7
Feb. 8.6	13.29 .19	53.3 2.2	38.61 .20	50.8 1.3	10.49 .46	77.9 2.0	40.92 .20	50.5 1.5
18.5	13.45 .14	55.3 2.0	38.78 .15	49.6 1.0	10.89 .33	80.1 2.4	41.10 .16	51.8 1.2
28.5	13.57 .10	57.2 1.8	38.91 .11	48.8 0.7	11.16 .21	82.7 2.7	41.24 .12	52.9 0.9
Mar. 10.5	13.64 .05	58.8 1.5	39.00 .06	48.2 0.5	11.30 +.08	85.4 2.8	41.33 .07	53.7 0.7
20.5	13.67 +.01	60.2 1.3	39.04 +.03	47.9 −0.2	11.32 −.04	88.2 2.8	41.38 +.03	54.2 0.4
30.4	13.67 −.02	61.3 1.0	39.05 −.01	47.8 0.0	11.22 .16	91.1 2.8	41.40 .00	54.5 −0.2
Apr. 9.4	13.63 .05	62.2 0.7	39.02 .04	47.9 +0.2	11.01 .26	93.7 2.6	41.38 −.03	54.6 0.0
19.4	13.58 .07	62.8 0.5	38.97 .06	48.2 0.3	10.71 .34	96.1 2.3	41.34 .05	54.6 +0.2
29.4	13.50 .08	63.2 0.3	38.91 .08	48.5 0.4	10.34 .41	98.2 1.9	41.28 .07	54.3 0.3
May 9.3	13.41 .10	63.4 −0.1	38.82 .09	49.0 0.5	9.91 .45	99.8 1.4	41.21 .08	54.0 0.4
19.3	13.31 .10	63.3 +0.2	38.73 .09	49.5 0.6	9.44 .48	101.0 0.9	41.12 .09	53.6 0.5
29.3	13.21 .10	63.1 0.4	38.64 .09	50.1 0.6	8.94 .50	101.7 +0.4	41.03 .09	53.1 0.5
June 8.2	13.10 .10	62.6 0.5	38.54 .09	50.7 0.6	8.45 .49	101.8 −0.1	40.94 .09	52.5 0.6
18.2	13.01 .10	62.0 0.7	38.45 .09	51.2 0.6	7.96 .47	101.5 0.6	40.85 .09	51.9 0.6
28.2	12.91 .09	61.3 0.8	38.37 .08	51.8 0.5	7.50 .44	100.6 1.1	40.76 .09	51.3 0.6
July 8.2	12.83 .08	60.4 0.9	38.29 .07	52.3 0.5	7.08 .40	99.2 1.6	40.67 .08	50.8 0.6
18.1	12.76 .07	59.4 1.0	38.22 .06	52.7 0.4	6.71 .35	97.4 2.1	40.60 .07	50.2 0.5
28.1	12.70 .05	58.4 1.1	38.17 .04	53.1 0.3	6.39 .29	95.1 2.5	40.54 .05	49.7 0.5
Aug. 7.1	12.66 .03	57.3 1.1	38.13 −.03	53.4 0.2	6.14 .22	92.5 2.8	40.50 .03	49.2 0.4
17.1	12.64 −.01	56.3 1.0	38.12 .00	53.6 +0.1	5.96 .14	89.5 3.1	40.48 −.01	48.9 0.3
27.0	12.65 +.02	55.3 0.9	38.13 +.02	53.6 −0.1	5.86 −.06	86.3 3.4	40.48 +.01	48.7 +0.1
Sept. 6.0	12.69 .06	54.4 0.8	38.16 .05	53.4 0.3	5.84 +.03	82.8 3.5	40.50 .04	48.7 −0.1
16.0	12.76 .09	53.8 0.6	38.23 .08	53.0 0.5	5.91 .12	79.2 3.6	40.56 .07	48.8 0.3
25.9	12.87 .13	53.3 +0.3	38.33 .12	52.4 0.7	6.08 .21	75.6 3.7	40.65 .11	49.2 0.5
Oct. 5.9	13.02 .17	53.2 0.0	38.46 .16	51.6 1.0	6.34 .31	71.9 3.6	40.78 .15	49.9 0.8
15.9	13.21 .21	53.3 −0.3	38.64 .19	50.4 1.3	6.69 .40	68.3 3.5	40.95 .19	50.8 1.1
25.9	13.43 .25	53.8 0.7	38.85 .23	49.0 1.5	7.14 .49	64.9 3.3	41.15 .23	52.0 1.3
Nov. 4.8	13.70 .28	54.7 1.1	39.10 .27	47.4 1.7	7.67 .58	61.7 3.1	41.40 .26	53.4 1.6
14.8	13.99 .31	56.0 1.4	39.39 .30	45.6 1.9	8.29 .65	58.8 2.7	41.68 .29	55.1 1.8
24.8	14.31 .33	57.5 1.7	39.70 .32	43.6 2.1	8.97 .71	56.4 2.2	41.98 .32	57.0 2.0
Dec. 4.8	14.65 .34	59.4 2.0	40.03 .34	41.4 2.2	9.71 .75	54.4 1.7	42.31 .34	59.1 2.1
14.7	15.00 .36	61.5 2.2	40.37 .34	39.2 2.2	10.47 .77	52.9 1.2	42.65 .34	61.3 2.2
24.7	15.34 .34	63.9 2.4	40.71 .34	37.0 2.2	11.24 .77	52.0 −0.6	42.99 .34	63.5 2.2
34.7	15.67 +.32	66.3 −2.4	41.04 +.32	34.9 −2.0	12.00 +.75	51.8 +0.1	43.32 +.32	65.7 −2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Leonis.		γ Ursæ Majoris.		o Virginis.		*4 Draconis (H.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 11 42	° ′ +15 15	h m 11 47	° ′ +54 22	h m 11 58	° ′ +9 24	h m 12 6	° ′ +78 17
	s	″	s	″	s	″	s	″
(Dec. 30.7)	47.90 +.34	27.7 −1.9	22.82 +.50	24.4 −1.0	57.27 +.34	52.4 −2.1	29.04 +1.21	35.2 −0.6
Jan. 9.7	48.24 .33	25.9 1.7	23.31 .48	23.7 −0.4	57.61 .33	50.4 1.9	30.23 1.16	35.0 +0.1
19.6	48.55 .30	24.4 1.4	23.77 .44	23.6 +0.2	57.92 .30	48.7 1.6	31.38 1.11	35.5 0.8
29.6	48.83 .26	23.2 1.0	24.19 .39	24.1 0.8	58.21 .27	47.2 1.3	32.43 1.00	36.5 1.4
Feb. 8.6	49.07 .22	22.3 0.7	24.55 .33	25.1 1.3	58.46 .23	46.0 1.0	33.36 .85	38.2 1.9
18.6	49.27 .18	21.8 −0.3	24.85 .26	26.6 1.7	58.67 .19	45.2 0.7	34.13 .68	40.3 2.4
28.5	49.43 .13	21.7 0.0	25.07 .18	28.5 2.0	58.83 .14	44.6 0.4	34.71 .48	42.8 2.7
Mar. 10.5	49.54 .09	21.8 +0.3	25.22 .11	30.7 2.3	58.96 .10	44.4 −0.1	35.09 .28	45.7 2.9
20.5	49.60 .05	22.2 0.5	25.29 +.04	33.0 2.4	59.04 .06	44.5 +0.2	35.26+ .07	48.6 3.0
30.4	49.62 +.01	22.8 0.7	25.30 −.03	35.5 2.5	59.08 +.03	44.7 0.4	35.23− .13	51.7 3.0
Apr. 9.4	49.62 −.02	23.6 0.8	25.24 .09	38.0 2.4	59.09 −.01	45.2 0.5	35.01 .32	54.6 2.9
19.4	49.58 .05	24.4 0.9	25.13 .14	40.3 2.2	59.07 .03	45.8 0.7	34.61 .49	57.4 2.6
29.4	49.52 .07	25.3 0.9	24.97 .18	42.4 2.0	59.03 .05	46.5 0.7	34.05 .63	59.8 2.3
May 9.3	49.44 .08	26.2 0.9	24.77 .21	44.2 1.7	58.96 .07	47.2 0.8	33.36 .75	61.9 1.9
19.3	49.35 .09	27.1 0.8	24.55 .23	45.7 1.3	58.89 .08	48.0 0.8	32.57 .83	63.5 1.4
29.3	49.25 .10	27.9 0.8	24.32 .24	46.8 0.9	58.80 .09	48.7 0.7	31.70 .89	64.6 0.8
June 8.3	49.15 .10	28.6 0.6	24.07 .25	47.5 +0.4	58.71 .09	49.4 0.7	30.79 .92	65.1 +0.3
18.2	49.05 .10	29.2 0.5	23.83 .24	47.7 0.0	58.62 .09	50.1 0.6	29.86 .93	65.1 −0.3
28.2	48.95 .09	29.6 0.4	23.59 .23	47.5 −0.5	58.52 .09	50.6 0.5	28.94 .91	64.6 0.8
July 8.2	48.86 .09	29.9 +0.2	23.37 .21	46.8 0.9	58.43 .09	51.1 0.4	28.06 .86	63.5 1.4
18.1	48.78 .08	30.0 0.0	23.17 .19	45.7 1.3	58.35 .08	51.4 0.3	27.23 .80	61.9 1.9
28.1	48.71 .06	30.0 −0.2	22.99 .16	44.1 1.7	58.27 .07	51.6 +0.1	26.47 .71	59.8 2.3
Aug. 7.1	48.66 .05	29.7 0.3	22.85 .13	42.2 2.1	58.21 .06	51.6 −0.1	25.81 .61	57.3 2.7
17.1	48.62 −.03	29.3 0.6	22.74 .09	40.0 2.4	58.16 .04	51.5 0.2	25.25 .50	54.4 3.1
27.0	48.61 .00	28.6 0.8	22.67 −.05	37.4 2.7	58.14 −.01	51.1 0.4	24.82 .37	51.2 3.4
Sept. 6.0	48.62 +.03	27.8 1.0	22.64 .00	34.5 3.0	58.13 +.01	50.6 0.6	24.51 .23	47.7 3.6
16.0	48.66 .06	26.7 1.2	22.67 +.05	31.4 3.2	58.16 .04	49.9 0.9	24.36− .08	44.0 3.8
26.0	48.74 .10	25.4 1.4	22.75 .11	28.2 3.3	58.22 .08	48.9 1.1	24.35+ .08	40.1 3.9
Oct. 5.9	48.86 .14	23.8 1.7	22.88 .17	24.9 3.4	58.32 .12	47.7 1.3	24.51 .24	36.3 3.9
15.9	49.01 .18	22.0 1.9	23.08 .23	21.5 3.4	58.46 .16	46.3 1.6	24.83 .40	32.4 3.8
25.9	49.21 .22	20.1 2.1	23.34 .29	18.1 3.3	58.64 .20	44.6 1.8	25.32 .57	28.7 3.6
Nov. 4.8	49.45 .26	18.0 2.2	23.66 .35	14.8 3.2	58.87 .24	42.7 2.0	25.96 .72	25.2 3.4
14.8	49.72 .29	15.7 2.3	24.03 .40	11.8 3.0	59.12 .28	40.6 2.1	26.76 .87	21.9 3.1
24.8	50.02 .32	13.4 2.3	24.45 .44	8.9 2.6	59.42 .31	38.4 2.3	27.70 1.00	19.1 2.6
Dec. 4.8	50.35 .34	11.1 2.3	24.91 .48	6.5 2.3	59.74 .33	36.2 2.3	28.74 1.10	16.7 2.1
14.7	50.69 .35	8.8 2.2	25.40 .50	4.5 1.8	60.07 .34	33.9 2.3	29.88 1.17	14.9 1.6
24.7	51.04 .35	6.7 2.1	25.90 .50	2.9 1.3	60.42 .34	31.7 2.2	31.06 1.20	13.6 0.9
34.7	51.39 +.34	4.7 −1.8	26.40 +.49	1.9 −0.7	60.76 +.33	29.6 −2.0	32.26 +1.19	13.0 −0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β Chamæleontis.		η Virginis.		α¹ Crucis.		β Corvi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$12^{h}\ 11^{m}$	$-78^{\circ}\ 37'$	$12^{h}\ 13^{m}$	$+0^{\circ}\ 0'$	$12^{h}\ 19^{m}$	$-62^{\circ}\ 24'$	$12^{h}\ 27^{m}$	$-22^{\circ}\ 42'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	7.74 +1.24	29.1 −1.6	37.28 +.34	57.6 −2.2	45.08 +.60	43.1 −1.8	55.87 +.36	53.5 −2.2
Jan. 9.7	8.95 1.17	30.9 2.1	37.61 .33	55.4 2.1	45.67 .57	45.1 2.3	56.22 .35	55.8 2.4
19.7	10.06 1.07	33.3 2.6	37.93 .31	53.4 2.0	46.22 .53	47.6 2.7	56.56 .33	58.1 2.4
29.7	11.07 .94	36.1 3.0	38.22 .28	51.5 1.7	46.72 .47	50.5 3.0	56 87 .30	60.6 2.4
Feb. 8.6	11.93 .79	39.4 3.4	38.48 .24	49.9 1.5	47.16 .41	53.6 3.3	57.15 .26	63.0 2.4
18.6	12.65 .64	42.9 3.7	38.70 .20	48.6 1.2	47.53 .34	57.0 3.5	57.39 .22	65.4 2.3
28.6	13.20 .47	46.7 3.8	38.87 .16	47.5 0.9	47.83 .26	60.6 3.6	57.59 .18	67.6 2.2
Mar. 10.5	13.58 .30	50.5 3.9	39.01 .12	46.7 0.7	48.05 .19	64.2 3.6	57.75 .14	69.7 2.0
20.5	13.79+ .13	54.4 3 9	39.11 .08	46.1 0.4	48.20 .11	67.8 3.5	57.87 .10	71.5 1.8
30.5	13.84− .04	58.3 3.8	39.17 .04	45.8 −0.2	48.28 +.04	71.3 3.4	57.94 .06	73.2 1.5
Apr. 9.5	13.72 .19	62.0 3.6	39.19 +.01	45.8 0.0	48.29 −.02	74.6 3.2	57.99 +.03	74.6 1.3
19.4	13.45 .34	65.5 3.4	39.19 −.02	45.9 +0.2	48.24 .08	77.6 3.0	58.00 .00	75.8 1.1
29.4	13.04 .48	68.7 3.1	39.16 .04	46.1 0.3	48.12 .14	80.4 2.6	57.98 −.03	76.8 0.9
May 9.4	12.51 .60	71.6 2.7	39.12 .06	46.5 0.4	47.96 .19	82.9 2.3	57.95 .05	77.5 0.6
19.4	11.86 .70	74.1 2.3	39.05 .07	47.0 0.5	47.75 .23	85.0 1.9	57.89 .07	78.0 0.4
29.3	11.11 .79	74.6 1.8	38.98 .08	47.5 0.6	47.51 .26	86.6 1.4	57.81 .08	78.2 −0.1
June 8.3	10.28 .86	77.7 1.3	38.90 .09	48.1 0.6	47.23 .29	87.8 1.0	57.73 .09	78.3 +0.1
18.3	9.40 .90	78.8 0.8	38.81 .09	48.7 0.6	46.92 .32	88.6 −0.5	57.63 .10	78.1 0.3
28.2	8.48 .93	79.3 −0.2	38.72 .09	49.3 0.6	46.60 .33	88.8 0.0	57.52 .11	77.7 0.5
July 8.2	7.55 .92	79.2 +0.3	38.63 .09	49.8 0.6	46.27 .33	88.5 +0.5	57.42 .11	77.1 0.7
18.2	6.64 .89	78.6 0.9	38.54 .09	50.4 0.5	45.95 .32	87.8 1.0	57.31 .11	76.3 0.9
28.2	5.79 .82	77.5 1.4	38.46 .08	50.9 0.4	45.64 .30	86.6 1.4	57.20 .10	75.4 1.0
Aug. 7.1	5.01 .73	75.8 1.9	33.39 .07	51.3 0.4	45.35 .27	85.0 1.8	57.11 .09	74.3 1.1
17.1	4.33 .61	73.8 2.3	38.33 .05	51.5 0.2	45.11 .22	83.0 2.2	57.02 .07	73.2 1.2
27.1	3.79 .46	71.3 2.6	38.29 −.03	51.7 +0.1	44.91 .17	80.7 2.4	56.96 .05	72.0 1.2
Sept. 6.1	3.42 .29	68.6 2.8	38.28 .00	51.7 −0.1	44.78 .10	78.2 2.6	56.92 −.02	70.9 1.1
16.0	3.22− .10	65.7 3.0	38.29 +.03	51.5 0.3	44.72 −.02	75.5 2.7	56.92 +.01	69.8 1.0
26.0	3.22+ .11	62.7 3.0	38.34 .07	51.1 0.5	44.74 +.07	72.9 2.6	56.95 .05	68.8 0.9
Oct. 6.0	3.43 .31	59.8 2.9	38.42 .11	50.5 0.8	44.85 .16	70.3 2.5	57.03 .10	68.1 0.6
15.9	3.85 .52	57.0 2.7	38.55 .15	49.6 1.0	45.05 .25	67.9 2.2	57.15 .15	67.7 +0.3
25.9	4.47 .72	54.5 2.3	38.72 .19	48.4 1.3	45.34 .34	65.9 1.9	57.32 .19	67.5 0.0
Nov. 4.9	5.28 .89	52.4 1.9	38.93 .23	47.0 1.6	45.72 .42	64.2 1.5	57.53 .24	67.7 −0.4
14.9	6.25 1.04	50.8 1.4	39.18 .27	45.3 1.8	46.18 .49	63.0 0.9	57.79 .26	68.2 0.7
24.8	7.36 1.16	49.7 0.8	39.46 .30	43.4 2.0	46.69 .55	62.3 +0.4	58.09 .32	69.1 1.1
Dec. 4.8	8.56 1.24	49.3 +0.1	39.77 .32	41.4 2.1	47.26 .59	62.3 −0.2	58.42 .34	70.4 1.5
14.8	9.82 1.27	49.5 −0.5	40.10 .34	39.2 2.2	47.86 .61	62.8 0.8	58.77 .36	72.1 1.8
24.8	11.09 1.27	50.3 1.2	40.45 .34	37.0 2.2	48.47 .61	63.9 1.4	59.13 .36	74.0 2.0
34.7	12.33 +1.22	51.8 −1.8	40.79 +.34	34.8 −2.2	49.07 +.60	65.6 −2.0	59.50 +.36	76.1 −2 3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*κ Draconis.		*32 Camelop. (foll.)		12 Can. Venaticorum.		θ Virginis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 12 28	° ′ +70 27	h m 12 48	° ′ +84 4	h m 12 50	° ′ +38 58	h m 13 3	° ′ −4 52
	s	″	s	″	s	″	s	″
(Dec. 30.7)	15.46 +.78	34.9 −1.1	19.14 +2.20	27.6 −1.0	16.94 +.40	41 6 −2.0	35.10 +.34	57.8 −2.2
Jan. 9.7	16.23 .77	34.1 −0.4	21.36 2.22	27.0 −0.3	17.34 .40	39.9 1.5	35.45 .34	60.0 2.1
19.7	16.96 .73	34.1 +0.3	23.56 2.16	27.0 +0.3	17.73 .38	38.7 0.9	35.78 .32	62.0 2.1
29.7	17.69 .67	34.7 0.9	25.66 2.03	27.6 1.0	18.10 .36	38.0 −0.4	36.09 .30	64.0 1.9
Feb. 8.6	18.32 .59	35.8 1.5	27.58 1.81	28.9 1.6	18.44 .32	37.9 +0.1	36.38 .27	65.8 1.7
18.6	18.85 .49	37.6 2.0	29.26 1.53	30.8 2.1	18.73 .27	38.3 0.6	36.64 .24	67.4 1.4
28.6	19.29 .37	39.8 2.4	30.63 1.20	33.1 2.5	18.96 .22	39.1 1.1	36.86 .20	68.7 1.2
Mar. 10.6	19.60 .25	42.3 2.7	31.65 .83	35.8 2.8	19.18 .17	40.4 1.5	37.05 .17	69.8 0.9
20.5	19.79 .13	45.1 2.9	32.28 .44	38.7 3.0	19:33 .12	42.0 1.8	37.20 .13	70.6 0.7
30.5	19.86 +.01	48.1 3.0	32.52 +.04	41.8 3.1	19.42 .07	43.9 2.0	37.31 .10	71.1 0.4
Apr. 9.5	19.81 −.11	51.0 2.9	32.36 −.35	44.9 3.0	19.47 +.03	46.0 2.1	37.38 .06	71.5 −0.2
19.4	19.65 .21	53.8 2.7	31.83 .72	47.8 2.9	19.48 −.02	48.1 2.1	37.43 .03	71.6 0.0
29.4	19.39 .30	56.4 2.5	30.94 1.05	50.6 2.6	19.44 .05	50.2 2.1	37.45 +.01	71.5 +0.1
May 9.4	19.04 .38	58.7 2.1	29.74 1.34	53.0 2.2	19.37 .08	52.3 1.9	37.45 −.02	71.3 0.3
19.4	18.63 .44	60.6 1.7	28.28 1.58	55.0 1.8	19.28 .11	54.1 1.7	37.42 .04	71.0 0.4
29.3	18.17 .48	62.1 1.2	26.61 1.76	56.5 1.3	19.16 .13	55.7 1.5	37.37 .05	70.6 0.4
June 8.3	17.67 .51	63.1 0.7	24.78 1.89	57.5 0.7	19.02 .14	57.0 1.2	37.31 .07	70.2 0.5
18.3	17.16 .52	63.5 +0.2	22.84 1.97	57.9 +0.2	18.88 .15	58.0 0.8	37.24 .08	69 6 0.5
28.3	16.63 .52	63.4 −0.3	20.86 1.99	57.8 −0.4	18.72 .16	58.7 0.5	37.16 .09	69.1 0.6
July 8.2	16.12 .51	62.8 0.9	18.88 1.96	57.2 0.9	18.56 .16	59.0 +0.1	37.06 .10	68.5 0.6
18.2	15.62 .48	61.7 1.4	16.95 1.89	56.0 1.5	18.40 .16	58.9 −0.3	36.96 .10	67.9 0.6
28.2	15.16 .44	60.1 1.9	15.12 1.77	54.3 2.0	18.24 .15	58.4 0.7	36.86 .10	67.4 0.5
Aug. 7.1	14.75 .39	58.0 2.3	13.42 1.62	52.1 2.4	18.10 .14	57.5 1.1	36.76 .10	66.9 0.5
17.1	14.30 .33	55.5 2.7	11.90 1.42	49.5 2.8	17.97 .12	56.3 1.4	36.67 .09	66.4 0.4
27.1	14.09 .26	52.6 3.1	10.59 1.20	46.4 3.2	17.86 .10	54.7 1.8	36.60 .07	66.1 0.3
Sept. 6.1	13.86 .18	49.4 3.3	9.51 .96	43.1 3.5	17.78 .07	52.7 2.1	36.54 .05	65.8 +0.2
16.0	13.72 −.10	45.9 3.6	8.69 .67	39.5 3.7	17.72 −.03	50.5 2.4	36.51 −.02	65.7 0.0
26.0	13.68 .00	42.3 3.7	8.17 .37	35.7 3.9	17.71 +.01	48.0 2.6	36.51 +.02	65.8 −0.2
Oct. 6.0	13.72 +.10	38.5 3.8	7.96 −.06	31.8 3.9	17.75 .06	45.2 2.9	36.54 .06	66.1 0.4
16.0	13.87 .20	34.6 3.8	8.06 +.27	27.9 3.9	17.83 .11	42.3 3.0	36.62 .10	66.7 0.7
25.9	14.13 .31	30.8 3.8	8.49 .60	24.0 3.8	17.96 .16	39.2 3.2	36.74 .15	67.5 0.9
Nov. 4.9	14.49 .42	27.2 3.6	9.26 .93	20.3 3.6	18.14 .21	36.0 3.2	36.91 .19	68.5 1.2
14.9	14.96 .51	23.7 3.3	10.35 1.25	16.8 3.3	18.38 .26	32.8 3.2	37.12 .23	69.9 1.5
24.8	15.52 .60	20.6 3.0	11.75 1.54	13.6 3.0	18.66 .31	29.7 3.0	37.38 .27	71.5 1.7
Dec. 4.8	16.16 .67	17.8 2.5	13.42 1.79	10.9 2.5	18.99 .35	26.8 2.8	37.67 .31	73.3 1.9
14.8	16.86 .73	15.6 2.0	15.31 1.99	8.7 2.0	19.35 .38	24.1 2.6	37.98 .33	75.3 2.0
24.8	17.61 .76	13.8 1.4	17.38 2.13	7.0 1.4	19.74 .39	21.7 2.2	38.32 .34	77.4 2.1
34.7	18.37 +.78	12.7 −0.8	19.55 +2.20	5.9 −0.7	20.13 +.39	19.7 −1.8	38.66 +.34	79.5 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Virginis. (*Spica.*)		*ζ* Virginis.		*η* Ursæ Majoris		*η* Bootis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 13 18	° ′ −10 31	h m 13 28	° ′ +0 1	h m 13 42	° ′ +49 54	h m 13 48	° ′ +19 0
	s	″	s	″	s	″	s	″
(Dec. 30.8)	42.89 +.35	8.9 −2.1	25.62 +.34	55.8 −2.2	41.85 +.43	78.4 −2.3	49.76 +.34	41.9 −2.4
Jan. 9.8	43.24 .35	11.0 2.1	25.96 .34	53.6 2.1	42.29 .44	76.4 1.8	50.10 .35	39.7 2.1
19.7	43.58 .33	13.1 2.1	26.29 .33	51.6 1.9	42.73 .44	74.9 1.2	50.45 .34	37.7 1.8
29.7	43.90 .31	15.1 2.0	26.61 .31	49.8 1.7	43.17 .43	74.1 −0.6	50.79 .32	36.2 1.4
Feb. 8.7	44.20 .29	17.0 1.8	26.91 .29	48.1 1.5	43.58 .40	73.8 +0.1	51.10 .31	35.0 1.0
18.7	44.47 .26	18.8 1.7	27.19 .26	46.8 1.2	43.97 .36	74.2 0.7	51.40 .28	34.3 0.5
28.6	44.71 .22	20.3 1.5	27.43 .22	45.7 0.9	44.30 .31	75.1 1.2	51.66 .25	34.0 −0.1
Mar. 10.6	44.91 .18	21.6 1.2	27.63 .19	44.9 0.6	44.59 .26	76.6 1.7	51.89 .21	34.1 +0.3
20.6	45.07 .15	22.7 1.0	27.80 .15	44.4 0.4	44.82 .20	78.5 2.1	52.08 .17	34.6 0.7
30.5	45.20 .11	23.6 0.8	27.93 .12	44.2 −0.1	45.00 .14	80.7 2.4	52.23 .14	35.4 1.0
Apr. 9.5	45.29 .08	24.3 0.6	28.03 .09	44.2 +0.1	45.11 .09	83.2 2.6	52.35 .10	36.5 1.2
19.5	45.36 .05	24.7 0.4	28.10 .06	44.4 0.3	45.17 +.03	85.8 2.7	52.43 .07	37.8 1.4
29.5	45.40 +.02	25.0 −0.2	28.15 +.03	44.7 0.4	45.18 −.02	88.5 2.7	52.48 .04	39.2 1.5
May 9.4	45.41 .00	25.1 0.0	28.16 .00	45.2 0.6	45.14 .07	91.1 2.5	52.50 +.01	40.7 1.5
19.4	45.39 −.02	25.0 +0.1	28.15 −.02	45.8 0.6	45.05 .11	93.5 2.3	52.49 −.02	42.3 1.5
29.4	45.36 .04	24.9 0.2	28.12 .04	46.5 0.7	44.92 .14	95.7 2.1	52.46 .04	43.7 1.4
June 8.3	45.31 .06	24.6 0.3	28.08 .06	47.1 0.7	44.77 .17	97.6 1.7	52.41 .06	45.1 1.3
18.3	45.24 .08	24.2 0.4	28.01 .07	47.8 0.7	44.58 .20	99.1 1.3	52.33 .08	46.2 1.1
28.3	45.16 .09	23.8 0.5	27.93 .09	48.4 0.6	44.37 .22	100.2 0.9	52.24 .10	47.3 0.9
July 8.3	45.07 .10	23.3 0.6	27.84 .10	49.1 0.6	44.15 .23	100.9 +0.5	52.14 .11	48.1 0.7
18.2	44.96 .10	22.7 0.6	27.74 .10	49.6 0.5	43.91 .24	101.1 0.0	52.02 .12	48.6 0.5
28.2	44.86 .11	22.1 0.6	27.63 .11	50.1 0.4	43.67 .24	100.9 −0.5	51.89 .13	49.0 +0.2
Aug. 7.2	44.75 .10	21.5 0.6	27.52 .11	50.5 0.4	43.44 .23	100.2 0.9	51.76 .13	49.0 −0.1
17.2	44.65 .09	20.9 0.6	27.42 .10	50.8 0.2	43.21 .22	99.0 1.4	51.64 .12	48.8 0.4
27.1	44.56 .08	20.3 0.5	27.33 .09	51.0 +0.1	43.00 .20	97.4 1.8	51.52 .11	48.3 0.6
Sept. 6.1	44.49 .06	19.8 0.4	27.25 .07	51.0 −0.1	42.81 .17	95.4 2.2	51.41 .10	47.5 0.9
16.1	44.44 −.03	19.5 0.3	27.19 .04	50.8 0.3	42.65 .14	93.0 2.6	51.33 .07	46.5 1.2
26.0	44.43 .00	19.2 +0.2	27.17 −.01	50.5 0.5	42.54 .09	90.3 2.9	51.27 −.04	45.1 1.5
Oct. 6.0	44.45 +.04	19.2 −0.1	27.18 +.03	49.9 0.7	42.48 −.04	87.3 3.2	51.25 .00	43.5 1.8
16.0	44.51 .09	19.4 0.3	27.23 .07	49.1 0.9	42.47 +.02	84.0 3.4	51.27 +.04	41.6 2.0
26.0	44.62 .13	19.8 0.6	27.32 .12	48.0 1.2	42.52 .08	80.5 3.5	51.34 .09	39.5 2.3
Nov. 4.9	44.78 .18	20.5 0.9	27.46 .16	46.7 1.4	42.63 .15	77.0 3.6	51.45 .14	37.1 2.4
14.9	44.98 .23	21.5 1.1	27.65 .21	45.1 1.7	42.81 .21	73.4 3.6	51.61 .19	34.6 2.6
24.9	45.23 .27	22.8 1.4	27.88 .25	43.4 1.9	43.05 .27	69.8 3.5	51.82 .23	32.0 2.7
Dec. 4.8	45.52 .30	24.3 1.7	28.15 .29	41.4 2.0	43.36 .33	66.5 3.3	52.07 .27	29.3 2.7
14.8	45.83 .32	26.1 1.9	28.45 .31	39.3 2.1	43.71 .38	63.3 3.0	52.36 .30	26.6 2.7
24.8	46.17 .34	28.0 2.0	28.77 .33	37.2 2.2	44.11 .41	60.6 2.6	52.68 .33	24.1 2.6
34.8	46.51 +.34	30.1 −2.1	29.11 +.34	35.0 −2.2	44.53 +.43	58.2 −2.1	53.01 +.34	21.7 −2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Centauri.		*α Draconis.		α Bootis. (*Arcturus.*)		θ Bootis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	13 55	−59 46	14 1	+64 57	14 10	+19 48	14 21	+52 24
	s	″	s	″	s	″	s	″
(Dec. 30.8)	8.11 +.58	33.1 −0.6	3.67 +.57	25.1 −2.3	2.97 +.33	72.4 −2.5	0.36 +.42	50.3 −2.7
Jan. 9.8	8.70 .59	33.9 1.0	4.25 .60	23.1 1.7	3.31 .34	70.1 2.2	0.79 .44	47.9 2.1
19.8	9.28 .58	35.2 1.5	4.86 .61	21.7 1.1	3.65 .34	68.0 1.9	1.24 .45	46.0 1.5
29.7	9.85 .56	36.9 1.9	5.47 .60	20.9 −0.4	3.98 .33	66.3 1.5	1.69 .45	44.8 0.9
Feb. 8.7	10.40 .52	39.0 2.3	6.06 .57	20.9 +0.3	4.31 .31	65.1 1.1	2.13 .43	44.2 −0.3
18.7	10.90 .48	41.5 2.6	6.61 .53	21.5 0.9	4.61 .29	64.2 0.6	2 55 .40	44 2 +0.4
28.6	11.35 .43	44.2 2.8	7.10 .46	22.7 1 5	4.88 .26	63.8 −0.2	2.93 .36	44.9 1.0
Mar. 10.6	11.75 .37	47.0 3.0	7.53 .39	24.4 2.0	5.12 .22	63.9 +0.3	3 27 .31	46.1 1.5
20.6	12.09 .31	50.0 3.0	7.88 .31	26.7 2.4	5.33 .19	64.3 0.6	3.56 .26	47.9 2.0
30.6	12.38 .25	53 1 3.1	8.14 .22	29.3 2.7	5.50 .15	65.1 1.0	3.79 .20	50.0 2.4
Apr. 9.5	12.60 .19	56.2 3.1	8.31 .13	32.1 2.9	5.64 .12	66.2 1.2	3.97 .15	52.5 2.6
19.5	12.76 .13	59.2 3.0	8.39 +.04	35.1 3.0	5.74 .09	67.5 1.4	4.08 .09	55.2 2.8
29.5	12.86 .07	62.0 2 8	8.39 −.05	38.1 3.0	5.81 .05	69 0 1.5	4.14 +.03	58.1 2.8
May 9.4	12.91 +.02	64.8 2.6	8.30 .13	41.1 2 8	5.85 +.02	70.6 1.6	4 14 −.03	60.9 2.8
19.4	12.89 −.04	67.3 2.4	8.14 .20	43.8 2.6	5.85 −.01	72.2 1.6	4.09 .08	63.6 2.6
29.4	12.83 .10	69.5 2 1	7.91 .26	46.2 2.3	5.84 .03	73.7 1.5	3.99 .12	66 1 2.4
June 8.4	12.71 .15	71.4 1.7	7.62 .31	48.3 1.9	5.79 .05	75.1 1.4	3.85 .16	68.3 2.1
18.3	12.54 .19	72.9 1.4	7.29 .36	50.0 1.5	5.73 .08	76.4 1.2	3.67 .20	70.3 1 7
28.3	12.33 .23	74.1 1.0	6.91 .39	51.2 1.0	5.64 .10	77 6 1.0	3.46 .22	71.8 1.3
July 8.3	12.08 .26	74.8 0.5	6.51 .42	52.0 +0.5	5.53 .11	78.4 0.8	3.22 .25	72.9 0.9
18.3	11.81 .29	75.1 −0.1	6.08 .43	52.2 −0.1	5.41 .13	79.1 0.5	2.97 .27	73.5 +0.4
28.2	11.51 .30	75.0 +0.4	5.65 .43	51.9 0.6	5.28 .14	79.5 +0.3	2.70 .28	73.7 −0 1
Aug. 7.2	11.21 .30	74.4 0.8	5.22 .43	51.0 1.1	5.14 .14	79.6 0.0	2.42 .28	73.3 0.6
17.2	10.91 .29	73.3 1.2	4 80 .41	49.7 1.6	5.00 .14	79.4 −0.3	2.14 .27	72.5 1.1
27.1	10.64 .26	71.9 1.6	4.41 .38	47.9 2.0	4.87 .13	79.0 0.6	1.87 .26	71.3 1.5
Sept. 6.1	10.39 .22	70.1 1.9	4.06 .34	45.6 2.5	4.75 .12	78.2 0.9	1.62 .24	69.5 1.9
16.1	10.19 .17	68.1 2.2	3.74 .29	43.0 2.9	4.64 .09	77.1 1.2	1.40 .20	67.4 2.4
26.1	10.06 .10	65.8 2.3	3.48 .22	39.9 3.2	4.56 .06	75.8 1.5	1.22 .16	64.8 2.7
Oct. 6.0	9.99 −.02	63.4 2.4	3.30 .15	36.6 3.5	4.52 −.03	74.1 1.8	1.06 .11	61.9 3.1
16.0	10.01 +.06	61.0 2.4	3.19 −.07	33 0 3.7	4 51 +.02	72.2 2.1	1.00 −.05	58.7 3.3
26 0	10.12 .15	58.7 2.2	3.17 +.02	29.2 3.8	4.55 .06	70.0 2.3	0.98 +.01	55.3 3.6
Nov. 5.0	10.32 .24	56.6 2.0	3.24 .12	25.4 3.9	4.64 .11	67.6 2.5	1.02 .08	51.7 3.7
14.9	10.60 .33	54.8 1.7	3.41 .22	21.5 3.8	4.77 .16	65.1 2.7	1.14 .15	48.0 3.7
24.9	10.98 .41	53.3 1.3	3.67 .31	17.8 3.7	4.96 .21	62.3 2.8	1.33 .22	44.3 3.6
Dec. 4.9	11.42 .48	52.3 0.8	4.02 .40	14.2 3.4	5.19 .25	59.6 2.8	1.58 .29	40.7 3.5
14.8	11.93 .53	51.7 +0.3	4.46 .47	11.0 3.1	5.46 .29	56.8 2.7	1.90 .34	37.3 3.3
24.8	12.48 .57	51.7 −0.2	4.96 .53	8.2 2.6	5.77 .32	54.1 2.6	2.27 .39	34.3 2.9
34.8	13.05 +.59	52.1 −0.7	5.51 +.57	5.8 −2.1	6.09 +.33	51.6 −2.3	2.68 +.42	31.6 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*5 Ursæ Minoris.		α² Centauri.		ε Bootis.		α² Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 13	h m 14 31	° ′ −60 19	h m 14 39	° ′ +27 35	h m 14 44	° ′ −15 31
	s	″	s	″	s	″	s	″
(Dec. 30.8)	47.50 +.84	67.8 −2.4	14.90 +.56	16.5 0.0	36.67 +.32	21.7 −2.6	4.04 +.32	48.6 −1.6
Jan. 9.8	48.39 .93	65.7 1.8	15.47 .58	16.8 −0.5	37.00 .34	19.2 2.3	4.37 .34	50.2 1.7
19.8	49.35 .98	64.2 1.2	16.06 .59	17.5 1.0	37.35 .35	17.1 1.9	4 72 .35	51.9 1.7
29.7	50.33 .99	63.3 −0.5	16.64 .58	18.7 1.4	37.70 .35	15.4 1.5	5.07 .34	53.6 1.7
Feb. 8.7	51.31 .97	63.2 +0.2	17.21 .56	20.3 1.8	38.04 .34	14.2 1.0	5.40 .33	55.2 1.6
18.7	52.26 .91	63.7 0.8	17.75 .52	22.3 2.1	38.36 .32	13.5 −0.5	5.72 .31	56.8 1.5
28.7	53.13 .82	64.8 1.5	18.24 .48	24.6 2.4	38.67 .29	13.2 +0.1	6.02 .28	58.2 1.4
Mar. 10.6	53.89 .71	66.5 2.0	18.70 .43	27.1 2.6	38.94 .26	13.5 0.5	6.29 .26	59.5 1.2
20.6	54.54 .57	68.8 2.4	19.10 .37	29.7 2.7	39.18 .22	14.3 1.0	6.53 .23	60.6 1.0
30.6	55.04 .42	71.4 2.8	19.44 .32	32.5 2.8	39.38 .19	15.5 1.4	6.75 .20	61.5 0.8
Apr. 9.6	55.38 .26	74.3 3.0	19.73 .26	35.4 2.9	39.55 .15	17.0 1.7	6.93 .17	62.2 0.7
19.5	55.56 +.10	77.4 3.1	19.96 .20	38.2 2.8	39.69 .11	18.8 1.9	7.09 .14	62.8 0.5
29.5	55.58 −.06	80.5 3.1	20.13 .14	41.0 2.8	39.78 .08	20.7 2.0	7.21 .11	63.2 0.3
May 9.5	55.44 .22	83.6 3.0	20.23 .08	43.7 2.6	39.84 .05	22.8 2.1	7.31 .08	63.5 0.2
19.4	55.15 .36	86.5 2.8	20.28 +.02	46.2 2.5	39.87 +.01	24.9 2.1	7.38 .05	63.6 −0.1
29.4	54.73 .49	89.1 2.5	20.26 −.04	48.6 2.2	39.87 −.02	26.9 2.0	7.41 +.02	63.7 0.0
June 8.4	54.18 .60	91.4 2.1	20.19 .10	50.7 2.0	39.84 .05	28.8 1.8	7.43 .00	63.6 +0.1
18.4	53.53 .69	93.3 1.7	20.06 .16	52.5 1.6	39.77 .08	30.5 1.6	7.41 −.03	63.4 0.2
28.3	52.80 .77	94.7 1.2	19.88 .21	53.9 1.3	39.69 .10	32.0 1.4	7.37 .06	63.2 0.3
July 8.3	52.00 .83	95.7 0.7	19.65 .25	55.0 0.9	39.58 .12	33.3 1.1	7.30 .08	62.9 0.3
18.3	51.15 .86	96.0 +0.1	19.38 .29	55.6 −0.4	39.44 .14	34.2 0.8	7.21 .10	62.6 0.4
28.3	50.28 .88	95.9 −0.4	19.07 .31	55.9 0.0	39.30 .15	34.8 0.4	7.10 .12	62.2 0.4
Aug. 7.2	49.40 .88	95.2 0.9	18.75 .33	55.7 +0.4	39.14 .16	35.0 +0.1	6.97 .13	61.7 0.5
17.2	48.53 .85	94.0 1.5	18.43 .33	55.0 0.9	38.97 .17	34.9 −0.3	6.84 .14	61.2 0.5
27.2	47.70 .81	92.3 1.9	18.10 .31	53.9 1.3	38.81 .16	34.5 0.6	6.71 .13	60.7 0.5
Sept. 6.1	46.92 .75	90.2 2.4	17.80 .28	52.5 1.6	38.65 .15	33.7 1.0	6.58 .12	60.2 0.5
16.1	46.22 .66	87.6 2.8	17.54 .24	50.7 2.0	38.51 .13	32.5 1.3	6.47 .10	59.7 0.5
26.1	45.60 .56	84.6 3.2	17.34 .18	48.6 2.2	38.40 .10	31.0 1.7	6.38 .08	59.3 0.4
Oct. 6.1	45.10 .44	81.3 3.5	17.20 .10	46.3 2.3	38.31 .07	29.2 2.0	6.32 −.04	59.0 0.3
16.0	44.73 .30	77.7 3.7	17.14 −.02	43.9 2.4	38.27 −.02	27.1 2.3	6.30 .00	58.8 +0.1
26.0	44.51 −.15	73.9 3.8	17.17 +.08	41.6 2.3	38.27 +.02	24.6 2.6	6.32 +.05	58.8 −0.1
Nov. 5.0	44.44 +.01	70.1 3.9	17.29 .17	39.3 2.2	38.32 .08	22.0 2.8	6.40 .10	59.0 0.3
15.0	44.53 .18	66.2 3.9	17.50 .26	37.2 2.0	38.42 .13	19.1 2.9	6.53 .15	59.4 0.6
24.9	44.79 .34	62.4 3.7	17.81 .35	35.4 1.6	38.56 .18	16.2 3.0	6.70 .20	60.1 0.8
Dec. 4.9	45.21 .50	58.8 3.5	18.20 .43	34.0 1.2	38.78 .23	13.2 3.0	6.93 .25	61.1 1.0
14.9	45.78 .65	55.4 3.2	18.66 .49	33.0 0.8	39.04 .27	10.2 2.9	7.20 .29	62.2 1.3
24.8	46.49 .77	52.5 2.7	19.17 .54	32.4 +0.3	39.33 .31	7.3 2.8	7.50 .32	63.5 1.4
34.8	47.32 +.87	50.0 −2.2	19.73 +.57	32.4 −0.2	39.64 +.33	4.7 −2.5	7.82 +.33	65.0 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β Ursæ Minoris.		β Bootis.		β Libræ.		μ¹ Bootis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	$14^{h}\ 51^{m}$	$+74^{\circ}\ 38'$	$14^{h}\ 57^{m}$	$+40^{\circ}\ 52'$	$15^{h}\ 10^{m}$	$-8^{\circ}\ 55'$	$15^{h}\ 19^{m}$	$+37^{\circ}\ 48'$
	s	"	s	"	s	"	s	"
(Dec. 30.8)	3.54 +.72	63.9 −2.7	18.31 +.34	16.5 −2.9	22.80 +.31	45.0 −1.6	50.09 +.31	16.4 −2.9
Jan. 9.8	4.30 .80	61.5 2.1	18.67 .36	13.9 2.5	23.12 .33	46.7 1.7	50.42 .34	13.6 2.6
19.8	5.14 .86	59.7 1.5	19.04 .36	11.6 2.0	23.45 .33	48.4 1.7	50.77 .36	11.2 2.2
29.8	6.02 .89	58.5 0.9	19.42 .38	9.9 1.5	23.78 .33	50.0 1.6	51.13 .37	9.3 1.6
Feb. 8.7	6.91 .89	58.0 −0.2	19.80 .38	8.8 0.9	24.11 .33	51.6 1.5	51.50 .36	7.9 1.1
18.7	7.78 .85	58.2 +0.5	20.17 .36	8.2 −0.3	24.43 .31	52.9 1.3	51.86 .35	7.2 −0.5
28.7	8.60 .79	59.0 1.2	20.51 .33	8.3 +0.3	24.73 .29	54.1 1.1	52.20 .33	6.9 +0.1
Mar. 10.7	9.34 .70	60.5 1.7	20.83 .30	8.9 0.9	25.01 .27	55.1 0.9	52.52 .31	7.3 0.7
20.6	9.98 .58	62.5 2.2	21.11 .26	10.0 1.4	25.27 .24	55.8 0.6	52.81 .27	8.2 1.2
30.6	10.50 .46	64.9 2.6	21.35 .22	11.7 1.8	25.50 .22	56.3 0.4	53.06 .24	9.7 1.6
Apr. 9.6	10.89 .32	67.7 2.9	21.55 .18	13.7 2.2	25.70 .19	56.6 −0.2	53.28 .20	11.5 2.0
19.5	11.14 .17	70.7 3.1	21.71 .13	16.0 2.4	25.87 .16	56.7 0.0	53.46 .16	13.7 2.3
29.5	11.24 +.03	73.9 3.2	21.82 .09	18.5 2.6	26.02 .13	56.7 +0.1	53.60 .12	16.1 2.5
May 9.5	11.20 −.11	77.0 3.1	21.89 .05	21.1 2.6	26.14 .11	56.5 0.3	53.70 .08	18.6 2.6
19.5	11.03 .24	80.1 3.0	21.91 +.01	23.7 2.6	26.23 .08	56.2 0.4	53.75 +.04	21.2 2.6
29.4	10.72 .37	82.9 2.7	21.90 −.03	26.2 2.5	26.29 .05	55.8 0.4	53.77 .00	23.8 2.5
June 8.4	10.30 .48	85.4 2.4	21.85 .07	28.6 2.3	26.32 +.02	55.3 0.5	53.75 −.04	26.2 2.4
18.4	9.77 .57	87.6 2.0	21.76 .11	30.7 2.0	26.32 −.01	54.9 0.5	53.69 .08	28.5 2.1
28.4	9.16 .65	89.3 1.5	21.64 .14	32.6 1.7	26.30 .04	54.4 0.5	53.60 .11	30.5 1.8
July 8.3	8.47 .72	90.6 1.0	21.49 .16	34.1 1.3	26.24 .07	53.9 0.5	53.47 .14	32.1 1.5
18.3	7.73 .76	91.3 +0.5	21.32 .19	35.2 0.9	26.16 .09	53.4 0.5	53.32 .17	33.5 1.2
28.3	6.95 .79	91.6 0.0	21.12 .20	35.9 0.5	26.06 .11	52.9 0.5	53.14 .19	34.4 0.8
Aug. 7.2	6.15 .80	91.3 −0.6	20.91 .22	36.2 +0.1	25.94 .13	52.4 0.4	52.94 .20	35.0 +0.3
17.2	5.35 .80	90.4 1.1	20.69 .22	36.0 −0.4	25.81 .14	52.0 0.4	52.73 .21	35.1 −0.1
27.2	4.56 .77	89.1 1.6	20.47 .22	35.4 0.8	25.67 .14	51.7 0.4	52.52 .22	34.8 0.5
Sept. 6.2	3.82 .73	87.3 2.1	20.26 .21	34.4 1.3	25.53 .13	51.3 0.3	52.31 .21	34.1 1.0
16.1	3.12 .66	85.0 2.5	20.06 .19	32.9 1.7	25.41 .12	51.1 0.2	52.10 .19	32.9 1.4
26.1	2.51 .58	82.3 2.9	19.89 .16	31.0 2.1	25.30 .10	51.0 +0.1	51.92 .17	31.3 1.8
Oct. 6.1	1.98 .47	79.2 3.2	19.75 .12	28.8 2.4	25.22 .06	51.0 −0.1	51.77 .13	29.4 2.2
16.1	1.57 .35	75.8 3.5	19.66 .07	26.2 2.8	25.18 −.02	51.2 0.3	51.66 .09	27.0 2.5
26.0	1.28 .22	72.2 3.7	19.61 −.02	23.3 3.0	25.18 +.02	51.5 0.5	51.59 −.04	24.4 2.8
Nov. 5.0	1.13 −.08	68.4 3.9	19.62 +.04	20.2 3.3	25.22 .07	52.1 0.7	51.58 +.02	21.4 3.1
15.0	1.13 +.08	64.5 3.9	19.69 .10	16.8 3.4	25.32 .12	52.9 0.9	51.62 .07	18.3 3.2
24.9	1.28 .22	60.7 3.8	19.82 .16	13.4 3.5	25.47 .17	53.8 1.1	51.73 .13	15.0 3.3
Dec. 4.9	1.59 .38	56.9 3.6	20.01 .22	10.0 3.4	25.66 .22	55.0 1.3	51.88 .19	11.6 3.4
14.9	2.04 .52	53.4 3.4	20.26 .27	6.6 3.3	25.90 .26	56.4 1.5	52.10 .24	8.3 3.3
24.9	2.62 .64	50.3 3.0	20.55 .31	3.4 3.0	26.17 .29	57.9 1.6	52.36 .28	5.1 3.1
34.8	3.32 +.75	47.6 −2.4	20.88 +.35	0.6 −2.7	26.48 +.32	59.6 −1.7	52.67 +.32	2.2 −2.8

FIXED STARS, 1877.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*γ³ Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$15^h\ 20^m$	$+72°\ 15'$	$15^h\ 29^m$	$+27°\ 7'$	$15^h\ 38^m$	$+6°\ 48'$	$15^h\ 44^m$	$+4°\ 50'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	54.38 +.56	55.7 −3.0	28.23 +.28	32.1 −2.8	11.96 +.28	39.9 −2.2	40.49 +.27	47.5 −2.1
Jan. 9.8	54.99 .66	53.0 2.5	28.53 .31	29.5 2.5	12.25 .30	37.8 2.1	40.78 .30	45.4 2.0
19.8	55.69 .73	50.8 1.9	28.85 .33	27.1 2.2	12.56 .32	35.8 1.9	41.09 .31	43.5 1.9
29.8	56.44 .77	49.2 1.3	29.19 .34	25.2 1.8	12.88 .32	34.0 1.7	41.40 .32	41.7 1.6
Feb. 8.8	57.21 .78	48.2 −0.6	29.53 .34	23.7 1.3	13.20 .32	32.5 1.4	41.72 .32	40.2 1.4
18.7	57.99 .76	48.0 +0.1	29.86 .33	22.7 0.8	13.52 .31	31.3 1.0	42.04 .31	39.0 1.1
28.7	58.74 .73	48.4 0.8	30.18 .31	22.2 −0.2	13.82 .30	30.4 0.7	42.34 .30	38.1 0.7
Mar. 10.7	59.43 .66	49.5 1.4	30.48 .29	22.2 +0.3	14.11 .28	29.9 −0.3	42.64 .28	37.6 −0.4
20.6	60.06 .58	51.2 1.9	30.76 .26	22.7 0.8	14.37 .26	29.8 +0.1	42.91 .26	37.4 0.0
30.6	60.59 .48	53.4 2.4	31.00 .23	23.7 1.2	14.62 .23	30.0 0.4	43.15 .23	37.5 +0.3
Apr. 9.6	61.01 .37	56.0 2.8	31.22 .20	25.1 1.6	14.83 .20	30.5 0.7	43.37 .21	38.0 0.6
19.6	61.32 .25	58.9 3.0	31.40 .17	26.9 1.9	15.02 .18	31.3 0.9	43.57 .18	38.7 0.8
29.5	61.51 .13	62.0 3.2	31.55 .13	28.9 2.1	15.19 .15	32.3 1.1	43.74 .16	39.6 1.0
May 9.5	61.56 +.01	65.2 3.2	31.66 .10	31.0 2.2	15.32 .12	33.5 1.2	43.88 .12	40.6 1.2
19.5	61.52 −.11	68.3 3.1	31.74 .06	33.2 2.2	15.43 .09	34.8 1.3	43.99 .10	41.8 1.2
29.5	61.35 .23	71.4 2.9	31.79 +.03	35.5 2.2	15.50 .06	36.1 1.3	44.07 .07	43.1 1.3
June 8.4	61.07 .33	74.2 2.7	31.80 −.01	37.6 2.1	15.54 +.03	37.4 1.3	44.13 +.04	44.3 1.2
18.4	60.69 .43	76.7 2.3	31.78 .04	39.6 1.9	15.56 .00	38.7 1.3	44.15 .00	45.6 1.2
28.4	60.22 .51	78.8 1.9	31.72 .07	41.5 1.7	15.54 −.03	39.9 1.2	44.13 −.03	46.7 1.1
July 8.3	59.68 .58	80.5 1.5	31.63 .10	43.1 1.5	15.49 .06	41.0 1.0	44.09 .06	47.8 1.0
18.3	59.07 .64	81.7 1.0	31.52 .13	44.4 1.2	15.41 .09	42.0 0.9	44.02 .08	48.7 0.8
28.3	58.41 .68	82.4 +0.5	31.38 .15	45.3 0.8	15.31 .11	42.8 0.7	43.93 .11	49.5 0.7
Aug. 7.3	57.72 .70	82.6 −0.1	31.22 .17	46.0 0.5	15.19 .13	43.4 0.5	43.81 .13	50.1 0.5
17.2	57.01 .71	82.2 0.6	31.05 .18	46.3 +0.1	15.06 .14	43.8 0.3	43.67 .14	50.6 0.4
27.2	56.31 .70	81.4 1.1	30.87 .18	46.3 −0.2	14.91 .15	44.1 +0.1	43.52 .15	50.8 +0.2
Sept. 6.2	55.62 .68	80.0 1.6	30.69 .18	45.8 0.6	14.76 .15	44.1 −0.1	43.37 .15	50.9 0.0
16.2	54.96 .63	78.2 2.1	30.52 .17	45.0 1.0	14.61 .14	43.9 0.3	43.23 .14	50.8 −0.2
26.1	54.36 .57	75.8 2.5	30.36 .14	43.9 1.3	14.48 .12	43.4 0.5	43.09 .12	50.4 0.5
Oct. 6.1	53.83 .49	73.1 2.9	30.23 .11	42.4 1.7	14.38 .09	42.8 0.8	42.99 .09	49.8 0.7
16.1	53.39 .39	70.0 3.3	30.14 .08	40.5 2.0	14.30 .06	41.9 1.0	42.91 .06	49.0 0.9
26.0	53.05 .28	66.6 3.5	30.08 −.03	38.3 2.3	14.27 −.01	40.7 1.3	42.87 −.02	48.0 1.1
Nov. 5.0	52.83 .16	63.0 3.7	30.08 +.02	35.9 2.6	14.27 +.03	39.3 1.5	42.87 +.03	46.8 1.4
15.0	52.74 −.02	59.2 3.8	30.12 .07	33.2 2.8	14.33 .08	37.7 1.7	42.93 .08	45.3 1.6
25.0	52.78 +.11	55.3 3.8	30.22 .13	30.3 3.0	14.44 .13	35.9 1.9	43.03 .13	43.6 1.8
Dec. 4.9	52.96 .25	51.5 3.7	30.37 .18	27.3 3.0	14.59 .18	33.9 2.1	43.18 .17	41.7 2.0
14.9	53.28 .38	47.9 3.5	30.58 .23	24.3 3.0	14.80 .22	31.7 2.2	43.37 .22	39.7 2.0
24.9	53.72 .50	44.5 3.2	30.82 .27	21.4 2.9	15.04 .26	29.6 2.2	43.61 .26	37.6 2.1
34.9	54.27 +.60	41.5 −2.8	31.11 +.30	18.6 −2.7	15.31 +.28	27.4 −2.1	43.88 +.29	35.5 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β^1 Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	15 48	+78 9	15 52	+27 13	15 53	−22 16	15 58	−19 28
	s	″	s	″	s	″	s	″
(Dec. 30.9)	25.66 +.68	57.3 −3.1	29.10 +.27	52.5 −2.8	2.89 +.30	14.2 −0.9	16.33 +.29	6.4 −1.0
Jan. 9.8	26.41 .83	54.4 2.7	29.38 .30	49.8 2.6	3.20 .33	15.1 1.0	16.64 .32	7.5 1.1
19.8	27.31 .95	52.0 2.1	29.69 .32	47.4 2.3	3.54 .34	16.1 1.1	16.96 .34	8.6 1.1
29.8	28.31 1.04	50.2 1.5	30.02 .33	45.3 1.9	3.88 .35	17.2 1.1	17.30 .34	9.7 1.2
Feb. 8.8	29.38 1.09	49.0 0.9	30.35 .33	43.7 1.4	4.23 .36	18.4 1.2	17.65 .34	10.9 1.2
18.7	30.49 1.10	48.5 −0.2	30.69 .33	42.5 0.9	4.58 .34	19.5 1.2	17.99 .34	12.0 1.1
28.7	31.58 1.07	48.6 +0.5	31.01 .32	41.9 −0.4	4.92 .33	20.7 1.1	18.32 .32	13.1 1.0
Mar. 10.7	32.62 1.00	49.4 1.1	31.32 .30	41.9 +0.2	5.24 .31	21.7 1.0	18.64 .31	14.1 0.9
20.7	33.57 .90	50.9 1.7	31.61 .28	42.3 0.7	5.54 .29	22.7 0.9	18.93 .29	14.9 0.8
30.6	34.41 .77	52.8 2.2	31.87 .25	43.2 1.1	5.82 .27	23.5 0.8	19.21 .27	15.6 0.7
Apr. 9.6	35.10 .61	55.3 2.6	32.11 .22	44.5 1.5	6.07 .24	24.2 0.7	19.47 .24	16.2 0.5
19.6	35.63 .44	58.0 2.9	32.31 .19	46.3 1.9	6.30 .22	24.9 0.6	19.70 .22	16.7 0.4
29.6	35.98 .26	61.1 3.1	32.48 .16	48.3 2.1	6.51 .19	25.4 0.5	19.90 .19	17.0 0.3
May 9.5	36.15 +.08	64.3 3.2	32.62 .12	50.4 2.2	6.68 .16	25.9 0.4	20.07 .16	17.3 0.2
19.5	36.14 −.11	67.5 3.2	32.72 .09	52.7 2.3	6.82 .13	26.2 0.3	20.22 .13	17.5 0.2
29.5	35.94 .29	70.6 3.1	32.79 .05	55.0 2.3	6.93 .09	26.5 0.3	20.33 .10	17.6 −0.1
June 8.4	35.57 .46	73.6 2.8	32.82 +.01	57.3 2.2	7.01 .06	26.7 0.2	20.42 .06	17.6 0.0
18.4	35.03 .61	76.2 2.5	32 82 −.02	59.5 2.1	7.06 +.03	26.9 0.1	20.46 +.03	17.7 0.0
28.4	34.35 .75	78.6 2.2	32.78 .06	61.5 1.9	7.06 −.01	27.0 −0.1	20.47 −.01	17.6 +0.1
July 8.4	33.54 .87	80.5 1.7	32.70 .09	63.2 1.6	7.04 .04	27.0 0.0	20.45 .04	17.6 0.1
18.3	32.62 .97	82.0 1.3	32.60 .12	64.7 1.3	6.97 .08	27.0 +0.1	20.39 .07	17.4 0.2
28.3	31.62 1.04	83.1 0.8	32.47 .15	65.9 1.0	6.88 .11	26.9 0.1	20.30 .10	17.2 0.2
Aug. 7.3	30.55 1.09	83.6 +0.3	32.31 .17	66.7 0.7	6.76 .13	26.7 0.2	20.19 .13	17.0 0.3
17.3	29.44 1.12	83.6 −0.3	32.14 .18	67.2 +0.3	6.62 .15	26.5 0.3	20.05 .15	16.7 0.3
27.2	28.31 1.12	83.1 0.8	31.95 .19	67.3 −0.1	6.47 .16	26.1 0.4	19.90 .16	16.4 0.4
Sept. 6.2	27.19 1.10	82.0 1.3	31.76 .19	67.1 0.4	6.31 .16	25.7 0.4	19.75 .16	16.0 0.4
16.2	26.12 1.05	80.5 1.8	31.58 .18	66.5 0.8	6.16 .15	25.2 0.5	19.59 .15	15.6 0.4
26.1	25.10 .98	78.5 2.2	31.41 .16	65.5 1.2	6.02 .13	24.7 0.5	19.45 .13	15.2 0.4
Oct. 6.1	24.17 .87	76.1 2.7	31.26 .13	64.1 1.5	5.90 .10	24.2 0.5	19.34 .10	14.8 0.4
16.1	23.36 .74	73.2 3.0	31.14 .10	62.4 1.9	5.82 .06	23.7 0.4	19.26 .06	14.5 0.3
26.1	22.70 .59	70.1 3.3	31.06 .06	60.4 2.2	5.78 −.02	23.3 0.3	19.21 −.02	14.3 0.2
Nov. 5.0	22.19 .42	66.6 3.6	31.03 −.01	58.0 2.5	5.79 +.04	23.1 0.2	19.22 +.03	14.2 +0.1
15.0	21.86 .23	63.0 3.7	31.05 +.05	55.4 2.7	5.86 .09	22.9 +0.1	19.27 .08	14.1 −0.1
25.0	21.73 −.03	59.2 3.8	31.13 .10	52.6 2.9	5.97 .14	22.9 −0.1	19.38 .14	14.3 0.3
Dec. 4.9	21.80 +.17	55.5 3.7	31.25 .15	49.6 3.0	6.14 .19	23.2 0.3	19.54 .19	14.7 0.5
14.9	22.08 .37	51.8 3.6	31.43 .20	46.7 3.0	6.36 .24	23.6 0.5	19.75 .23	15.3 0.7
24.9	22.55 .56	48.4 3.3	31.65 .24	43 7 2.9	6.62 .28	24.2 0.7	20.00 .27	16.0 0.8
34.9	23.20 +.74	45.3 −2.9	31.92 +.28	40.9 −2.7	6.92 +.32	25.0 −0.9	20.29 +.30	16.9 −1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	16 5	+68 7	16 7	−3 22	16 16	+46 35	16 21	−26 9
	s	″	s	″	s	″	s	″
(Dec. 30.9)	57.19 +.39	43.0 −3.3	53.26 +.27	41.7 −1.6	1.34 +.27	67.7 −3.3	51.10 +.29	29.9 −0.4
Jan. 9.9	57.63 .48	39.9 2.9	53.54 .29	43.3 1.7	1.63 .32	64.5 3.0	51.41 .32	30.4 0.6
19.8	58.15 .55	37.2 2.4	53.84 .31	45.0 1.6	1.97 .35	61.7 2.6	51.74 .34	31.1 0.7
29.8	58.73 .60	35.0 1.9	54.15 .32	46.5 1.5	2.33 .38	59.4 2.1	52.08 .35	31.9 0.8
Feb. 8.8	59.35 .63	33.5 1.2	54.47 .32	47.9 1.3	2.71 .39	57.6 1.5	52.44 .36	32.7 0.9
18.8	59.99 .64	32.6 −0.5	54.79 .32	49.1 1.1	3.10 .39	56.4 0.9	52.79 .35	33.6 0.9
28.7	60.63 .63	32.4 +0.2	55.10 .31	50.0 0.8	3.49 .38	55.9 −0.2	53.14 .35	34.5 0.9
Mar. 10.7	61.24 .60	32.9 0.8	55.40 .29	50.7 0.5	3.87 .37	56.0 +0.4	53.48 .33	35.4 0.8
20.7	61.82 .55	34.0 1.4	55.68 .27	51.1 −0.3	4.23 .34	56.7 1.0	53.81 .32	36.2 0.8
30.7	62.34 .49	35.7 2.0	55.95 .25	51.2 0.0	4.55 .31	58.0 1.6	54.12 .30	37.0 0.7
Apr. 9.6	62.79 .41	38.0 2.5	56.19 .23	51.1 +0.2	4.85 .28	59.8 2.0	54.40 .27	37.7 0.7
19.6	63.16 .32	40.6 2.8	56.41 .21	50.8 0.4	5.10 .23	62.0 2.4	54.66 .25	38.3 0.6
29.6	63.43 .23	43.6 3.1	56.60 .18	50.2 0.6	5.31 .19	64.6 2.7	54.90 .22	38.9 0.5
May 9.5	63.61 .13	46.7 3.2	56.77 .15	49.5 0.7	5.48 .14	67.4 2.9	55.11 .19	39.4 0.5
19.5	63.70 +.04	50.0 3.3	56.91 .13	48.7 0.8	5.60 .09	70.4 3.0	55.29 .16	39.9 0.5
29.5	63.68 −.06	53.2 3.2	57.02 .09	47.9 0.9	5.66 +.04	73.4 3.0	55.43 .13	40.3 0.4
June 8.5	63.57 .16	56.3 3.0	57.10 .06	47.0 0.9	5.68 −.01	76.4 2.9	55.54 .09	40.7 0.4
18.4	63.37 .25	59.3 2.8	57.14 +.03	46.1 0.9	5.65 .06	79.2 2.7	55.61 .05	41.1 0.3
28.4	63.06 .33	61.9 2.5	57.15 .00	45.3 0.8	5.57 .10	81.8 2.5	55.65 +.01	41.4 0.3
July 8.4	62.72 .40	64.1 2.1	57.13 −.04	44.5 0.8	5.45 .15	84.1 2.1	55.64 −.03	41.6 0.2
18.4	62.29 .46	66.0 1.6	57.08 .07	43.8 0.7	5.28 .18	86.0 1.8	55.60 .06	41.8 0.1
28.3	61.80 .51	67.4 1.2	57.00 .10	43.1 0.6	5.08 .22	87.6 1.4	55.52 .10	41.9 −0.1
Aug. 7.3	61.26 .56	68.3 0.7	56.89 .12	42.6 0.5	4.85 .25	88.8 0.9	55.40 .13	41.9 0.0
17.3	60.69 .58	68.7 +0.1	56.76 .14	42.1 0.4	4.59 .27	89.5 +0.5	55.27 .15	41.8 +0.2
27.2	60.10 .59	68.6 −0.4	56.62 .15	41.8 0.3	4.31 .28	89.7 0.0	55.11 .16	41.6 0.3
Sept. 6.2	59.51 .60	67.9 0.9	56.47 .15	41.6 +0.2	4.03 .29	89.4 −0.5	54.94 .17	41.3 0.4
16.2	58.93 .57	66.8 1.4	56.32 .15	41.5 0.0	3.75 .28	88.7 1.0	54.77 .16	40.9 0.5
26.2	58.38 .53	65.1 1.9	56.18 .13	41.6 −0.1	3.48 .26	87.5 1.5	54.62 .15	40.4 0.5
Oct. 6.1	57.87 .48	63.0 2.4	56.06 .11	41.8 0.3	3.23 .23	85.8 1.9	54.48 .12	39.9 0.6
16.1	57.42 .41	60.4 2.8	55.97 .07	42.2 0.5	3.02 .19	83.7 2.3	54.37 .09	39.3 0.6
26.1	57.06 .33	57.5 3.1	55.91 −.03	42.7 0.7	2.86 .14	81.2 2.7	54.31 −.04	38.8 0.5
Nov. 5.0	56.78 .23	54.2 3.4	55.90 +.01	43.5 0.9	2.74 .08	78.3 3.0	54.29 +.01	38.2 0.5
15.0	56.60 .12	50.6 3.7	55.93 .06	44.5 1.1	2.69 −.02	75.2 3.3	54.32 .06	37.8 0.4
25.0	56.53 −.01	46.9 3.8	56.02 .11	45.6 1.2	2.70 +.04	71.8 3.5	54.41 .12	37.5 +0.2
Dec. 5.0	56.58 +.11	43.1 3.8	56.15 .16	46.9 1.4	2.78 .11	68.3 3.6	54.55 .17	37.4 0.0
14.9	56.74 .22	39.4 3.7	56.34 .20	48.4 1.5	2.92 .17	64.8 3.5	54.75 .22	37.5 −0.1
24.9	57.02 .33	35.8 3.5	56.56 .24	50.0 1.6	3.13 .23	61.3 3.4	54.99 .26	37.7 0.3
34.9	57.40 +.43	32.5 −3.2	56.82 +.27	51.7 −1.7	3.39 +.29	58.0 −3.2	55.27 +.30	38.1 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.		*A Draconis.		ζ Ophiuchi.		*α Trianguli Australis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ +61 47	h m 16 28	° ′ +69 1	h m 16 30	° ′ −10 19	h m 16 35	° ′ −68 47
	s	″	s	″	s	″	s	″
(Dec. 30.9)	17.91 +.31	15.6 −3.5	11.30 +.35	44.0 −3.5	22.34 +.26	5.0 −1.3	36.45 +.57	54.7 +1.8
Jan. 9.9	18.26 .38	12.3 3.1	11.70 .45	40.7 3.1	22.62 .28	6.3 1.3	37.06 .66	53.0 1.4
19.8	18.67 .44	9.4 2.6	12.19 .53	37.8 2.6	22.91 .30	7.6 1.3	37.75 .72	51.8 1.0
29.8	19.13 .48	7.1 2.1	12.75 .59	35.4 2.1	23.22 .32	8.8 1.2	38.49 .76	51.0 0.6
Feb. 8.8	19.63 .51	5.3 1.5	13.37 .64	33.7 1.5	23.54 .32	10.0 1.1	39.27 .79	50.6 +0.2
18.8	20.15 .52	4.2 0.8	14.02 .66	32.5 0.8	23.87 .32	11.1 1.0	40.07 .80	50.7 −0.2
28.7	20.68 .52	3.7 −0.1	14.68 .66	32.0 −0.1	24.18 .32	11.9 0.8	40.86 .79	51.1 0.6
Mar. 10.7	21.18 .50	3.9 +0.5	15.33 .64	32.3 +0.6	24.50 .31	12.6 0.6	41.65 .77	51.9 1.0
20.7	21.67 .47	4.8 1.2	15.95 60	33.1 1.2	24.80 .29	13.1 0.4	42.41 .74	53.1 1.3
30.7	22.11 .42	6.3 1.8	16.52 .54	34.6 1.8	25.08 .27	13.3 −0.2	43.13 .70	54.6 1.7
Apr. 9.6	22.51 .36	8.3 2.3	17.02 .47	36.7 2.3	25.34 .25	13.4 0.0	43.80 .65	56.4 1.9
19.6	22.84 .30	10.8 2.7	17.45 .38	39.2 2.7	25.58 .23	13.3 +0.2	44.41 .58	58.4 2.2
29.6	23.11 .23	13.6 3.0	17.78 .29	42.0 3.0	25.80 .21	13.0 0.3	44.96 .51	60.7 2.4
May 9.5	23.31 .16	16.7 3.2	18.02 .19	45.1 3.2	26.00 .18	12.6 0.4	45.44 .43	63.1 2.5
19.5	23.43 .08	19.9 3.2	18.16 +.09	48.4 3.3	26.17 .15	12.1 0.5	45.83 .35	65.6 2 6
29.5	23.47 +.01	23.1 3.2	18.19 −.02	51.7 3.3	26.30 .12	11.6 0.6	46.13 .25	68.2 2.6
June 8.5	23.45 −.07	26.3 3.1	18.13 .12	54.9 3.2	26.41 .09	11.0 0.6	46.33 .16	70.8 2.6
18.4	23.34 .14	29.4 2.9	17.96 .21	58.0 3.0	26.48 .05	10.5 0.6	46.44 +.06	73.4 2.5
28.4	23.17 .20	32.1 2.6	17.70 .30	60.8 2.7	26.51 +.02	9.9 0.5	46.45 −.04	75.8 2.3
July 8.4	22.94 .27	34.6 2.3	17.35 .39	63.3 2.3	26.51 −.02	9.4 0.5	46.35 .14	78.0 2.1
18.4	22.64 .32	36.7 1.9	16.93 .46	65.4 1.9	26.47 .05	8.9 0.5	46.16 .23	80.0 1.8
28.3	22.29 .37	38.3 1.4	16.44 .52	67.1 1.5	26.41 .09	8.5 0.4	45 89 .32	81.7 1.5
Aug. 7.3	21.90 .41	39.5 1.0	15.89 .57	68.3 1.0	26.31 .11	8.1 0.4	45.54 .39	83.0 1.1
17.3	21.47 .44	40.2 +0.5	15.30 .61	69.1 +0.5	26.18 .13	7.7 0.3	45.12 .44	83.9 0.7
27.2	21.03 .45	40.4 −0.1	14.68 .63	69.3 −0.1	26.04 .15	7.4 0.3	44.66 .48	84.3 −0.2
Sept. 6.2	20.57 .46	40.1 0.6	14.05 .63	69.0 0.6	25.89 .16	7.1 0.2	44.17 .49	84.2 +0.3
16.2	20.12 .45	39.2 1.1	13.42 .62	68.1 1.1	25.73 .15	6.9 0.2	43.68 .48	83.7 0.8
26.2	19.69 .42	37.9 1.6	12.82 .59	66.8 1.6	25.58 .14	6.8 +0.1	43.22 .45	82.7 1.2
Oct. 6.1	19.28 .38	36.0 2.1	12.25 .54	65.0 2.1	25.45 .12	6.8 0.0	42.80 .39	81.2 1.7
16.1	18.93 .33	33.7 2.5	11.74 .48	62.7 2.5	25.34 .09	6.8 −0.1	42.45 .31	79.4 2.0
26 1	18.63 .27	31.0 2.9	11.30 .40	60.0 2.9	25.27 −.05	7.0 0.3	42.19 .21	77.3 2.3
Nov. 5.1	18.40 .19	27.9 3.2	10.95 .30	56.9 3.3	25.25 .00	7.4 0.4	42.04 −.09	74.9 2.5
15.0	18.25 .10	24.6 3 5	10.70 .19	53.5 3.5	25.27 +.05	7.9 0 6	42.00 +.03	72.3 2.6
25.0	18.19 −.01	21.0 3.7	10.56 −.08	49.9 3.7	25.34 .09	8.6 0.7	42.10 .16	69.8 2.6
Dec. 5.0	18.22 +.08	17.2 3.8	10.55 +.04	46.1 3.8	25.46 .14	9.4 0.9	42.32 .29	67.2 2.5
14.9	18.35 .17	13.5 3.7	10.65 .16	42.4 3.7	25.62 .19	10.4 1.1	42.66 .41	64.8 2.3
24.9	18.56 .26	9.9 3.6	10.87 .28	38.7 3.6	25.83 .23	11.5 1.2	43.12 .51	62.7 2.0
34.9	18.86 +.34	6.4 −3.3	11.20 +.39	35.3 −3.3	26.08 +.27	12.7 −1.3	43.68 +.60	60.8 +1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Herculis.		κ Ophiuchi.		d Herculis.		*ε Ursæ Minoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 38	° ′ +39 8	h m 16 51	° ′ +9 33	h m 16 57	° ′ +33 44	h m 16 58	° ′ +82 13
	s	″	s	″	s	″	s	″
(Dec. 30.9)	39.62 +.23	71.3 −3.2	49.83 +.23	53.7 −2.2	2.59 +.21	37.8 −3.1	29.42 +.50	55.0 −3.5
Jan. 9.9	39.87 .28	68.2 3.0	50.07 .25	51.6 2.1	2.82 .25	34.8 2.9	30.07 .79	51.7 3.1
19.9	40.16 .31	65.3 2.6	50.34 .28	49.5 1.9	3.09 .28	32.1 2.6	30.99 1.05	48.7 2.7
29.8	40.49 .34	62.9 2.2	50.62 .30	47.7 1.7	3.39 .31	29.7 2.2	32.15 1.27	46.3 2.2
Feb. 8.6	40.83 .35	60.9 1.7	50.92 .31	46.2 1.4	3.71 .33	27.7 1.8	33.51 1.44	44.3 1.7
18.8	41.18 .36	59.6 1.1	51.23 .31	44.9 1.1	4.04 .34	26.2 1.2	35.01 1.55	42.9 1.1
28.8	41.54 .35	58.8 −0.5	51.53 .31	44.0 0.7	4.38 .34	25.2 0.7	36.60 1.61	42.1 −0.4
Mar. 10.7	41.89 .34	58.6 +0.1	51.84 .30	43.6 −0.3	4.71 33	24.8 −0.1	38 21 1.60	42.1 +0.3
20.7	42.22 .33	59.0 0.7	52.13 .29	43.5 +0.1	5.04 .32	25.1 +0.5	39.78 1.53	42.6 0.9
30.7	42.54 .30	60.0 1.3	52.41 .27	43.8 0.5	5.35 .30	25.8 1.0	41.25 1.41	43.8 1.5
Apr. 9.6	42.83 .28	61.5 1.7	52.68 .26	44.4 0.8	5.64 .28	27.1 1.5	42.58 1.24	45.6 2.0
19.6	43.09 .24	63.4 2.1	52.92 .23	45.4 1.1	5.90 .25	28.8 1.9	43.71 1.03	47.9 2.5
29.6	43.31 .21	65.7 2.5	53.14 .21	46.6 1.4	6.13 .22	30.9 2.3	44.62 .78	50.5 2.8
May 9.6	43.50 .17	68.3 2.7	53.34 .18	48.1 1.5	6.34 .19	33.3 2.5	45.27 .52	53.4 3.1
19.5	43.65 .13	71.1 2.8	53.51 .16	49.7 1.7	6.50 .15	36.0 2.7	45.65 +.24	56.6 3.2
29.5	43.75 .08	74.0 2.9	53.65 .12	51.4 1.7	6.63 .11	38.7 2.8	45.75 −.05	59.8 3.2
June 8.5	43.81 +.04	76.8 2.8	53.76 .09	53.1 1.7	6.72 .07	41.4 2.7	45.56 .33	63.0 3.2
18.5	43.83 −.01	79.6 2.7	53.83 .05	54.8 1.7	6.77 +.03	44.1 2.6	45.10 .60	66.2 3.0
28.4	43.80 .05	82.2 2.5	53.86 +.02	56.4 1.6	6.78 −.02	46.7 2.5	44.38 .85	69.1 2.8
July 8.4	43.73 .09	84.6 2.2	53.86 −.02	57.9 1.4	6.74 .06	49.1 2.3	43.41 1.09	71.7 2.5
18.4	43.62 .13	86.6 1.9	53.82 .06	59.3 1.3	6.66 .10	51.2 2.0	42.22 1.29	74.1 2.1
28.3	43.47 .17	88.4 1.6	53.75 .09	60.4 1.1	6.54 .14	53.0 1.7	40.83 1.47	76.0 1.7
Aug. 7.3	43.28 .20	89.7 1.2	53.65 .12	61.4 0.9	6.38 .17	54.5 1.3	39.29 1.62	77.5 1.3
17.3	43.07 .22	90.7 0.7	53.52 .14	62.1 0.6	6.20 .20	55.6 0.9	37.61 1.72	78.6 0.8
27.3	42.84 .24	91.2 +0.3	53.37 .16	62.6 0.4	6.00 .22	56.3 0.5	35.85 1.80	79.2 +0.3
Sept. 6.2	42.60 .25	91.3 −0.2	53.21 .17	62.9 +0.2	5.77 .22	56.6 +0.1	34.03 1.83	79.2 −0.2
16.2	42.35 .24	90.9 0.6	53.04 .17	62.9 −0.1	5.55 .23	56.5 −0.3	32.20 1.82	78.8 0.7
26.2	42.11 .23	90.1 1.1	52.88 .16	62.7 0.4	5.33 .22	55.9 0.8	30.39 1.76	77.8 1.2
Oct. 6.2	41.89 .21	88.8 1.5	52.72 .14	62.2 0.6	5.12 .20	54.9 1.2	28.66 1.68	76.4 1.7
16.1	41.70 .18	87.1 1.9	52.59 .12	61.5 0.9	4.93 .17	53.6 1.6	27.04 1.55	74.5 2.1
26.1	41.54 .13	85.0 2.3	52.49 .08	60.4 1.1	4.78 .13	51.8 2.0	25.57 1.37	72.2 2.5
Nov. 5.1	41.43 .08	82.5 2.7	52.43 −.04	59.2 1.4	4.67 .09	49.6 2.3	24.30 1.16	69.5 2.9
15.0	41.38 −.03	79.7 3.0	52.42 +.01	57.7 1.6	4.60 −.04	47.1 2.7	23.27 .91	66.4 3.2
25.0	41.38 +.03	76.6 3.2	52.45 .06	55.9 1.8	4.59 +.02	44.3 2.9	22.50 .63	63.1 3.4
Dec. 5.0	41.43 .09	73.4 3.3	52.53 .11	54.0 2.0	4.64 .07	41.3 3.1	22.02 .33	59.6 3.6
15.0	41.55 .15	70.1 3.3	52.66 .15	52.0 2.1	4.74 .13	38.2 3 2	21.85 −.01	56.0 3.5
24.9	41.73 .20	66.8 3.3	52.83 .19	49.8 2.1	4.89 .18	35.1 3.2	22.00 +.30	52.5 3.5
34.9	41.96 +.26	63.6 −3.2	53.04 +.24	47.7 −2.1	5.09 +.22	32.0 −3.1	22.45 +.61	49.1 −3.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α^1 Herculis.		44 Ophiuchi.		β Draconis.		α Ophiuchi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 17 9	° ′ +14 31	h m 17 18	° ′ −24 3	h m 17 27	° ′ +52 23	h m 17 29	° ′ +12 38
	s	″	s	″	s	″	s	″
(Dec. 30.9)	1.36 +.20	44.2 −2.4	50.49 +.24	41.2 −0.2	37.30 +.18	20.4 −3.5	12.45 +.19	53.5 −2.2
Jan. 9.9	1.58 .24	41.9 2.3	50.74 .27	41.5 0.3	37.51 .24	17.0 3.3	12.66 .22	51.3 2.2
19.9	1.83 .26	39.7 2.1	51.02 .30	41.8 0.4	37.77 .29	13.8 3.0	12.89 .25	49.2 2.0
29.9	2.11 .28	37.7 1.8	51.33 .32	42.2 0.4	38.09 .34	10.9 2.6	13.15 .27	47.3 1.8
Feb. 8.8	2.40 .30	36.0 1.5	51.66 .33	42.7 0.5	38.45 .38	8.6 2.1	13.44 .29	45.7 1.5
18.8	2.70 .31	34.7 1.1	51.99 .34	43.2 0.4	38.84 .40	6.7 1.5	13.73 .30	44.3 1.1
28.8	3.01 .31	33.8 0.7	52.34 .34	43.6 0.4	39.24 .41	5.5 0.9	14.03 .30	43.4 0.7
Mar. 10.7	3.31 .30	33.3 −0.3	52.68 .34	44.0 0.4	39.66 .42	4.9 −0.2	14.33 .30	42.9 −0.3
20.7	3.61 .30	33.2 +0.2	53.01 .33	44.3 0.3	40.07 .41	5.0 +0.4	14.64 .30	42.8 +0.1
30.7	3.90 .28	33.6 0.6	53.34 .32	44.6 0.2	40.48 .39	5.8 1.1	14.93 .29	43.1 0.5
Apr. 9.7	4.18 .27	34.4 1.0	53.65 .31	44.8 0.2	40.86 .37	7.1 1.6	15.21 .28	43.8 0.9
19.6	4.43 .25	35.5 1.3	53.95 .29	45.0 0.1	41.20 .33	9.0 2.1	15.48 .26	44.8 1.2
29.6	4.67 .22	37.0 1.6	54.23 .27	45.1 0.1	41.52 .29	11.4 2.6	15.73 .24	46.2 1.5
May 9.6	4.88 .20	38.7 1.8	54.49 .24	45.2 0.1	41.78 .24	14.1 2.9	15.96 .21	47.9 1.7
19.6	5.06 .17	40.6 1.9	54.72 .21	45.2 0.1	42.00 .19	17.1 3.1	16.16 .19	49.7 1.9
29.5	5.21 .14	42.5 2.0	54.92 .18	45.3 0.1	42.16 .13	20.3 3.2	16.33 .16	51.6 2.0
June 8.5	5.33 .10	44.5 2.0	55.08 .15	45.4 0.1	42.27 .08	23.6 3.3	16.47 .12	53.6 2.0
18.5	5.42 .07	46.5 2.0	55.21 .11	45.5 0.1	42.32 +.02	26.8 3.2	16.57 .09	55.5 1.9
28.4	5.46 +.03	48.4 1.9	55.30 .07	45.6 0.1	42.30 −.04	30.0 3.1	16.64 .05	57.4 1.8
July 8.4	5.47 −.01	50.2 1.7	55.34 +.02	45.8 0.1	42.23 .10	33.0 2.8	16.67 +.01	59.2 1.7
18.4	5.44 .05	51.8 1.5	55.34 −.02	45.9 0.1	42.10 .16	35.7 2.6	16.65 −.03	60.8 1.5
28.4	5.37 .08	53.2 1.3	55.30 .06	46.0 0.1	41.91 .21	38.0 2.2	16.60 .07	62.2 1.3
Aug. 7.3	5.27 .12	54.4 1.1	55.23 .10	46.1 −0.1	41.68 .26	40.1 1.8	16.52 .10	63.5 1.1
17.3	5.14 .14	55.3 0.8	55.11 .13	46.2 0.0	41.40 .29	41.6 1.4	16.40 .13	64.4 0.9
27.3	4.99 .16	56.0 0.5	54.97 .15	46.2 0.0	41.09 .32	42.8 0.9	16.26 .16	65.2 0.6
Sept. 6.3	4.82 .17	56.4 +0.2	54.81 .17	46.1 +0.1	40.76 .34	43.4 +0.4	16.09 .17	65.6 0.3
16.2	4.64 .18	56.4 −0.1	54.64 .17	46.0 0.2	40.41 .35	43.6 −0.1	15.92 .18	65.8 +0.1
26.2	4.47 .17	56.2 0.4	54.47 .17	45.8 0.2	40.06 .35	43.2 0.6	15.74 .17	65.7 −0.2
Oct. 6.2	4.30 .16	55.7 0.7	54.30 .15	45.5 0.3	39.73 .33	42.3 1.1	15.57 .16	65.3 0.5
16.1	4.15 .13	54.9 1.0	54.16 .13	45.2 0.3	39.41 .30	41.0 1.6	15.42 .14	64.7 0.8
26.1	4.04 .10	53.8 1.3	54.05 .09	44.8 0.3	39.13 .26	39.1 2.1	15.29 .11	63.7 1.1
Nov. 5.1	3 96 .06	52.4 1.5	53.99 −.05	44.5 0.3	38.89 .21	36.8 2.5	15.20 .07	62.5 1.4
15.1	3.92 −.01	50.7 1.8	53.96 .00	44.2 0.3	38.72 .15	34.1 2.9	15.15 −.03	61.0 1.6
25.0	3.93 +.04	48.8 2.0	53.99 +.06	44.0 0.2	38.60 .08	31.1 3.2	15.15 +.02	59.2 1.9
Dec. 5.0	3.99 .08	46.7 2.2	54.07 .11	43.8 +0.1	38.56 −.01	27.8 3.4	15.19 .07	57.3 2.0
15.0	4.10 .13	44.4 2.3	54.21 .16	43.8 0.0	38.58 +.06	24.3 3.5	15.28 .11	55.2 2.1
25.0	4.25 .17	42.1 2.3	54.39 .21	43.8 −0.1	38.68 .12	20.8 3.5	15.41 .16	53.0 2.2
34.9	4.45 +.21	39.8 −2.3	54.62 +.25	44.0 −0.2	38.84 +.20	17.3 −3.4	15.59 +.20	50.8 −2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ω Draconis.		μ Herculis.		*ψ^1 Draconis (*pr.*)		γ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$17^{h}\ 37^{m}$	$+68^{\circ}\ 48'$	$17^{h}\ 41^{m}$	$+27^{\circ}\ 47'$	$17^{h}\ 44^{m}$	$+72^{\circ}\ 12'$	$17^{h}\ 53^{m}$	$+51^{\circ}\ 29'$
	s	″	s	″	s	″	s	″
Jan. 0.0	36.88 +.17	36.7 −3.6	37.48 +.16	27.0 −2.9	3.40 +.15	18.1 −3.6	43.18 +.13	61.9 −3.5
9.9	37.10 .28	33.2 3.4	37.66 .20	24.1 2.8	3.62 .29	14.6 3.5	43.34 .20	58.5 3.4
19.9	37.43 .38	29.9 3.1	37.88 .24	21.5 2.6	3.97 .41	11.3 3.2	43.57 .26	55.2 3.1
29.9	37.86 .47	26.9 2.7	38.14 .27	19.0 2.3	4.44 .52	8.3 2.8	43.85 .31	52.3 2.8
Feb. 8.8	38.37 .54	24.5 2.2	38.42 .29	16.9 1.9	5.00 .61	5.7 2.3	44.18 .35	49.7 2.3
18.8	38.94 .60	22.5 1.6	38.72 .31	15.2 1.4	5.65 .68	3.7 1.7	44.54 .38	47.7 1.8
28.8	39.56 .63	21.2 1.0	39.03 .32	14.1 0.9	6.36 .73	2.4 1.1	44.93 .40	46.2 1.2
Mar. 10.8	40.20 .65	20.6 −0.3	39.35 .32	13.4 −0.4	7.10 .75	1.6 −0.4	45.33 .41	45.4 −0.5
20.7	40.84 .64	20.6 +0.4	39.66 .31	13.3 +0.2	7.84 .74	1.6 +0.3	45.74 .41	45.2 +0.2
30.7	41.47 .61	21.3 1.0	39.97 .31	13.7 0.7	8.58 .72	2.2 0.9	46.15 .40	45.7 0.8
Apr. 9.7	42.06 .57	22.7 1.6	40.27 .29	14.6 1.2	9.27 .67	3.5 1.5	46.53 .38	46.8 1.4
19.7	42.60 .51	24.6 2.2	40.56 .28	16.0 1.6	9.90 .60	5.3 2.1	46.90 .35	48.5 1.9
29.6	43.07 .44	27.0 2.6	40.82 .25	17.8 2.0	10.46 .51	7.6 2.6	47.23 .32	50.6 2.4
May 9.6	43.47 .35	29.8 3.0	41.06 .22	20.0 2.3	10.92 .41	10.4 2.9	47.53 .27	53.2 2.8
19.6	43.77 .26	32.9 3.2	41.27 .19	22.3 2.5	11.28 .30	13.4 3.2	47.78 .22	56.1 3.1
29.5	43.98 .16	36.2 3.4	41.45 .16	24.9 2.6	11.52 .18	16.7 3.3	47.98 .17	59.3 3.2
June 8.5	44.09 +.06	39.6 3.4	41.59 .12	27.5 2.7	11.64 +.06	20.0 3.4	48.12 .12	62.6 3.3
18.5	44.09 −.05	43.0 3.4	41.69 .08	30.2 2.6	11.64 −.06	23.4 3.4	48.21 +.06	65.9 3.3
28.5	43.99 .15	46.3 3.2	41.75 +.04	32.7 2.5	11.51 .18	26.7 3.2	48.24 .00	69.2 3.2
July 8.4	43.79 .25	49.4 3.0	41.76 −.01	35.2 2.3	11.27 .30	29.9 3.0	48.20 −.06	72.3 3.0
18.4	43.50 .34	52.3 2.7	41.73 .05	37.4 2.1	10.92 .41	32.8 2.8	48.11 .12	75.2 2.8
28.4	43.12 .42	54.9 2.4	41.66 .09	39.4 1.9	10.46 .51	35.4 2.4	47.96 .18	77.8 2.5
Aug. 7.4	42.66 .50	57.0 2.0	41.56 .13	41.1 1.6	9.91 .59	37.6 2.0	47.76 .23	80.1 2.1
17.3	42.13 .56	58.8 1.5	41.41 .16	42.5 1.2	9.28 .67	39.4 1.6	47.51 .27	82.0 1.7
27.3	41.55 .60	60.0 1.0	41.24 .18	43.6 0.9	8.58 .72	40.8 1.1	47.22 .30	83.4 1.2
Sept. 6.3	40.93 .63	60.8 +0.5	41.05 .20	44.2 0.5	7.84 .76	41.6 0.6	46.91 .33	84.4 0.8
16.2	40.29 .65	61.1 0.0	40.84 .21	44.5 +0.1	7.07 .78	42.0 +0.1	46.57 .34	85.0 +0.3
26.2	39.64 .65	60.8 −0.5	40.63 .21	44.4 −0.3	6.28 .78	41.8 −0.5	46.23 .34	85.0 −0.3
Oct. 6.2	39.00 .62	60.1 1.0	40.42 .20	43.9 0.7	5.51 .76	41.1 1.0	45.89 .33	84.4 0.8
16.2	38.40 .58	58.8 1.6	40.23 .18	43.0 1.1	4.77 .71	39.9 1.5	45.57 .31	83.4 1.3
26.1	37.85 .53	56.9 2.1	40.06 .15	41.7 1.5	4.09 .65	38.1 2.0	45.27 .26	81.9 1.8
Nov. 5.1	37.36 .45	54.7 2.5	39.93 .11	40.1 1.8	3.48 .57	35.9 2.4	45.02 .23	79.9 2.2
15.1	36.95 .36	52.0 2.9	39.84 .07	38.0 2.2	2.97 .46	33.3 2.8	44.82 .18	77.5 2.6
25.1	36.64 .26	48.9 3.2	39.80 −.02	35.7 2.5	2.56 .34	30.3 3.2	44.67 .11	74.7 3.0
Dec. 5.0	36.44 .14	45.6 3.5	39.81 +.03	33.2 2.7	2.28 .21	27.0 3.4	44.59 −.05	71.6 3.2
15.0	36.36 −.03	42.0 3.6	39.86 .08	30.4 2.8	2.13 −.06	23.5 3.6	44.58 +.02	68.3 3.4
25.0	36.39 +.09	38.4 3.6	39.97 .13	27.6 2.9	2.13 +.06	19.9 3.6	44.64 .09	64.8 3.5
34.9	36.54 +.22	34.8 −3.6	40.13 +.18	24.7 −2.9	2.26 +.20	16.3 −3.5	44.77 +.16	61.3 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^2 Sagittarii.		μ^1 Sagittarii.		*σ Octantis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 17 57	° ′ -30 25	h m 18 6	° ′ -21 5	h 18	° ′ -89 16
	s	″	s	″	m s	″
Jan. 0.0	53.27 +.20	32.3 +0.4	23.38 +.18	28.4 -0.2	17 28.72 + 6.39	41.6 +3.3
9.9	53.50 .25	32.0 0.3	23.58 .22	28.6 0.2	17 36.75 9.56	38.3 3.1
19.9	53.76 .28	31.7 0.2	23.81 .25	28.9 0.2	17 47.77 12.41	35.3 2.9
29.9	54.06 .31	31.5 0.1	24.08 .28	29.1 0.2	18 1.46 14.90	32.5 2.6
Feb. 8.9	54.37 .33	31.4 0.1	24.37 .30	29.3 0.2	18 17.45 16.98	30.1 2.2
18.8	54.71 .34	31.4 +0.1	24.68 .31	29.5 0.2	18 35.29 18.61	28.1 1.8
28.8	55.06 .35	31.3 0.0	25.00 .32	29.7 -0.1	18 54.54 19.79	26.6 1.3
Mar. 10.8	55.41 .36	31.3 0.0	25.32 .33	29.7 0.0	19 14.73 20.50	25.6 0.8
20.7	55.77 .36	31.3 0.0	25.65 .33	29.7 +0.1	19 35.41 20.78	25.0 +0.3
30.7	56.12 .35	31.3 0.0	25.98 .33	29.5 0.2	19 56.16 20.65	24.9 -0.2
Apr. 9.7	56.47 .34	31.3 0.0	26.30 .32	29.3 0.2	20 16.58 20.10	25.4 0.7
19.7	56.81 .33	31.3 0.0	26.62 .31	29.1 0.3	20 36.25 19.14	26.2 1.1
29.6	57.13 .31	31.4 -0.1	26.92 .29	28.7 0.3	20 54.75 17.79	27.5 1.5
May 9.6	57.43 .29	31.5 0.1	27.20 .28	28.4 0.4	21 11.73 16.09	29.3 1.9
19.6	57.71 .26	31.7 0.2	27.47 .25	28.0 0.4	21 26.83 14.05	31.4 2.3
29.6	57.95 .23	31.9 0.3	27.70 .22	27.7 0.3	21 39.74 11.71	33.8 2.6
June 8.5	58.17 .20	32.2 0.3	27.91 .19	27.4 0.3	21 50.17 9.10	36.5 2.8
18.5	58.34 .15	32.5 0.4	28.08 .15	27.1 0.2	21 57.88 6.28	39.4 2.9
28.5	58.48 .11	32.9 0.4	28.21 .11	26.9 0.2	22 2.70 3.32	42.4 3.0
July 8.4	58.56 .06	33.4 0.5	28.30 .07	26.8 +0.1	22 4.51 + 0.27	45.4 3.0
18.4	58.60 +.01	33.8 0.5	28.34 +.02	26.8 0.0	22 3.25 - 2.78	48.4 2.9
28.4	58.59 -.03	34.3 0.5	28.34 -.02	26.8 0.0	21 58.97 5.74	51.2 2.7
Aug. 7.4	58.53 .08	34.8 0.4	28.30 .06	26.8 0.0	21 51.82 8.51	53.8 2.4
17.3	58.44 .12	35.2 0.4	28.22 .10	26.9 -0.1	21 42.04 10.99	56.1 2.1
27.3	58.31 .15	35.5 0.3	28.10 .13	26.9 -0.1	21 29.96 13.09	58.0 1.7
Sept. 6.3	58.15 .17	35.7 -0.2	27.96 .16	27.0 0.0	21 16.00 14.71	59.4 1.2
16.3	57.97 .19	35.8 0.0	27.79 .17	27.0 0.0	21 0.70 15.77	60.3 -0.6
26.2	57.78 .19	35.8 +0.1	27.62 .17	27.0 0.0	20 44.63 16.33	60.6 0.0
Oct. 6.2	57.60 .18	35.6 0.2	27.45 .17	27.0 +0.1	20 28.42 16.04	60.3 +0.8
16.2	57.43 .16	35.3 0.4	27.29 .15	26.9 0.1	20 12.73 15.18	59.4 1.2
26.1	57.29 .12	34.9 0.5	27.16 .12	26.7 0.1	19 58.22 13.88	57.9 1.8
Nov. 5.1	57.18 .08	34.4 0.5	27.06 .08	26.6 0.1	19 45.52 11.50	55.9 2.3
15.1	57.12 -.04	33.9 0.6	27.00 -.04	26.5 0.1	19 35.19 8.99	53.4 2.7
25.1	57.11 +.02	33.3 0.6	26.98 +.01	26.4 +0.1	19 27.68 5.98	50.5 3.0
Dec. 5.0	57.16 .07	32.7 0.6	27.01 .06	26.4 0.0	19 23.32 - 2.70	47.3 3.3
15.0	57.25 .12	32.1 0.5	27.09 .11	26.4 0.0	19 22.31 + 0.71	44.0 3.4
25.0	57.40 .18	31.7 0.5	27.22 .15	26.4 -0.1	19 24.73 4.14	40.6 3.4
35.0	57.60 +.22	31.3 +0.4	27.40 +.20	26.6 -0.2	19 30.59 + 7.45	37.2 +3.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Serpentis.		1 Aquilæ.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 18 14	° ′ −2 55	h m 18 28	° ′ −8 19	h m 18 32	° ′ +38 39	h m 18 45	° ′ +33 12
	s	″	s	″	s	″	s	″
Jan. 0.0	55.61 +.15	52.8 −1.3	29.73 +.15	50.2 −0.8	44.84 +.09	63.6 −3.2	30.85 +.09	67.0 −2.9
9.9	55.79 .19	54.1 1.3	29.89 .18	51.1 0.9	44.96 .15	60.4 3.1	30.95 .13	64.1 2.9
19.9	55.99 .22	55.3 1.2	30.09 .21	52.0 0.9	45.13 .19	57.4 2.9	31.11 .18	61.3 2.8
29.9	56.22 .25	56.5 1.1	30.32 .24	52.8 0.8	45.34 .23	54.6 2.7	31.31 .22	58.6 2.5
Feb. 8.9	56.48 .27	57.5 0.9	30.57 .26	53.5 0.6	45.59 .27	52.1 2.3	31.54 .25	56.2 2.2
18.8	56.75 .28	58.3 0.7	30.85 .28	54.1 0.5	45.88 .30	50.0 1.9	31.80 .28	54.2 1.8
28.8	57.04 .29	58.9 0.5	31.13 .29	54.4 0.3	46.18 .32	48.4 1.8	32.09 .30	52.6 1.3
Mar. 10.8	57.34 .30	59.3 −0.2	31.43 .30	54.6 −0.1	46.51 .34	47.4 0.8	32.40 .31	51.6 0.8
20.8	57.64 .30	59.3 +0.1	31.74 .31	54.6 +0.2	46.85 .34	46.9 −0.2	32.72 .32	51.1 −0.2
30.7	57.94 .30	59.1 0.4	32.04 .31	54.3 0.4	47.20 .34	47.1 +0.4	33.04 .33	51.2 +0.4
Apr. 9.7	58.24 .30	58.6 0.6	32.35 .31	53.8 0.6	47.54 .34	47.8 1.0	33.37 .33	51.8 0.9
19.7	58.53 .29	57.9 0.8	32.65 .30	53.1 0.8	47.87 .33	49.1 1.6	33.69 .32	53.0 1.4
29.6	58.81 .27	57.0 1.0	32.95 .29	52.3 0.9	48.19 .31	50.9 2.0	34.00 .30	54.6 1.9
May 9.6	59.08 .26	55.9 1.2	33.22 .27	51.3 1.0	48.48 .28	53.1 2.4	34.30 .28	56.7 2.3
19.6	59.32 .23	54.7 1.3	33.48 .25	50.3 1.1	48.75 .25	55.7 2.7	34.57 .25	59.1 2.6
29.6	59.54 .21	53.4 1.3	33.72 .22	49.2 1.1	48.98 .21	58.5 3.0	34.80 .22	61.8 2.8
June 8.5	59.73 .18	52.1 1.3	33.93 .19	48.1 1.1	49.17 .17	61.5 3.1	35.01 .19	64.7 2.9
18.5	59.89 .14	50.8 1.3	34.10 .16	47.1 1.0	49.32 .13	64.7 3.1	35.17 .14	67.6 3.0
28.5	60.01 .10	49.5 1.2	34.24 .12	46.1 0.9	49.42 .08	67.8 3.1	35.29 .10	70.6 3.0
July 8.5	60.09 .06	48.4 1.1	34.34 .08	45.2 0.9	49.47 +.03	70.8 3.0	35.37 +.05	73.5 2.9
18.4	60.13 +.02	47.3 1.0	34.40 +.04	44.4 0.7	49.47 −.03	73.7 2.8	35.39 .00	76.3 2.7
28.4	60.13 −.02	46.4 0.9	34.41 −.01	43.8 0.6	49.42 .07	76.4 2.6	35.37 −.05	78.9 2.5
Aug. 7.4	60.09 .06	45.6 0.7	34.38 .05	43.2 0.5	49.33 .12	78.8 2.3	35.30 .09	81.3 2.2
17.3	60.01 .10	45.0 0.6	34.32 .09	42.7 0.4	49.18 .16	80.9 1.9	35.19 .13	83.3 1.9
27.3	59.89 .13	44.5 0.4	34.22 .12	42.4 0.3	49.00 .20	82.7 1.5	35.04 .17	85.0 1.5
Sept. 6.3	59.76 .15	44.2 0.3	34.08 .14	42.2 0.2	48.79 .23	84.0 1.1	34.85 .20	86.4 1.2
16.3	59.60 .16	44.0 +0.1	33.93 .16	42.0 +0.1	48.56 .24	84.9 0.7	34.64 .22	87.2 0.8
26.2	59.44 .17	43.9 0.0	33.77 .17	42.0 0.0	48.31 .25	85.4 +0.2	34.42 .23	87.9 +0.3
Oct. 6.2	59.27 .16	44.0 −0.2	33.61 .16	42.1 −0.1	48.05 .25	85.4 −0.2	34.19 .23	88.0 −0.1
16.2	59.12 .15	44.3 0.3	33.45 .15	42.2 0.2	47.81 .24	84.9 0.7	33.97 .22	87.7 0.6
26.2	58.98 .12	44.6 0.5	33.31 .13	42.4 0.3	47.58 .22	84.0 1.2	33.76 .20	86.9 1.0
Nov. 5.1	58.87 .09	45.2 0.6	33.20 .09	42.8 0.4	47.38 .18	82.6 1.6	33.57 .17	85.7 1.4
15.1	58.80 .05	45.9 0.8	33.13 .06	43.2 0.5	47.21 .14	80.8 2.0	33.42 .13	84.1 1.8
25.1	58.77 −.01	46.7 0.9	33.09 −.02	43.8 0.6	47.09 .10	78.6 2.4	33.31 .09	82.1 2.2
Dec. 5.0	58.79 +.04	47.7 1.0	33.10 +.03	44.4 0.7	47.02 −.05	76.0 2.7	33.24 −.04	79.8 2.5
15.0	58.85 .08	48.8 1.1	33.15 .08	45.2 0.8	47.00 +.01	73.2 2.9	33.22 +.01	77.2 2.7
25.0	58.95 .12	50.0 1.2	33.24 .12	46.0 0.8	47.04 .06	70.2 3.1	33.25 .06	74.4 2.8
35.0	59.09 +.17	51.2 −1.3	33.38 +.16	46.8 −0.9	47.12 +.11	67.1 −3.1	33.33 +.10	71.6 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		*50 Draconis.		ζ Aquilæ.		d Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 18 47	° ′ −26 26	h m 18 50	° ′ +75 16	h m 18 59	° ′ +13 40	h m 19 10	° ′ −19 10
	s	″	s	″	s	″	s	″
Jan. 0.0	37.21 +.15	59.1 +0.4	13.82 −.09	68.4 −3.5	44.17 +.10	47.9 −2.0	25.23 +.11	18.0 −0.1
10.0	37.38 .19	58.8 0.3	13.81 +.07	64.9 3.5	44.28 .13	45.8 2.0	25.36 .15	18.0 −0.1
19.9	37.58 .22	58.5 0.3	13.96 .24	61.4 3.4	44.43 .17	43.9 1.9	25.53 .19	18.1 0.0
29.9	37.82 .25	58.2 0.3	14.28 .39	58.2 3.2	44.62 .20	42.0 1.8	25.73 .22	18.1 0.0
Feb. 8.9	38.09 .28	57.9 0.3	14.75 .54	55.2 2.8	44.83 .23	40.3 1.5	25.97 .25	18.0 +0.1
18.9	38.38 .30	57.5 0.3	15.34 .66	52.6 2.4	45.07 .25	39.0 1.2	26.23 .27	17.9 0.1
28.8	38.69 .32	57.2 0.4	16.05 .75	50.5 1.8	45.33 .27	37.9 0.9	26.50 .29	17.6 0.2
Mar. 10.8	39.01 .33	56.8 0.4	16.84 .83	49.0 1.2	45.61 .28	37.3 −0.5	26.80 .30	17.3 0.4
20.8	39.35 .34	56.4 0.4	17.69 .87	48.1 −0.6	45.90 .29	37.0 0.0	27.11 .31	16.8 0.5
30.8	39.69 .34	55.9 0.5	18.57 .87	47.8 +0.1	46.20 .30	37.2 +0.4	27.43 .32	16.3 0.6
Apr. 9.7	40.04 .34	55.4 0.5	19.45 .86	48.3 0.8	46.50 .30	37.7 0.8	27.75 .33	15.6 0.7
19.7	40.37 .34	54.9 0.5	20.29 .82	49.4 1.4	46.80 .30	38.8 1.2	28.08 .33	14.8 0.8
29.7	40.70 .33	54.5 0.5	21.08 .75	51.0 1.9	47.09 .29	40.1 1.5	28.40 .32	14.0 0.8
May 9.6	41.02 .31	54.0 0.4	21.78 .66	53.2 2.4	47.38 .28	41.8 1.8	28.71 .31	13.2 0.8
19.6	41.33 .29	53.6 0.4	22.39 .55	55.8 2.8	47.65 .26	43.7 2.0	29.02 .29	12.3 0.8
29.6	41.61 .27	53.3 0.3	22.87 .42	58.8 3.1	47.89 .23	45.8 2.2	29.30 .27	11.5 0.8
June 8.6	41.86 .24	53.1 0.2	23.23 .28	62.0 3.3	48.11 .20	48.0 2.2	29.55 .24	10.8 0.7
18.5	42.08 .20	53.0 +0.1	23.44 +.14	65.4 3.5	48.29 .17	50.2 2.3	29.78 .21	10.1 0.6
28.5	42.25 .16	52.9 0.0	23.50 −.01	68.9 3.5	48.44 .13	52.5 2.2	29.97 .17	9.6 0.5
July 8.5	42.39 .11	53.0 −0.1	23.42 .16	72.4 3.4	48.55 .09	54.6 2.1	30.11 .12	9.2 0.4
18.5	42.47 .06	53.2 0.2	23.19 .30	75.8 3.3	48.62 +.04	56.7 2.0	30.22 .08	8.9 0.2
28.4	42.51 +.01	53.5 0.3	22.82 .44	79.0 3.1	48.64 .00	58.6 1.8	30.27 +.03	8.7 +0.1
Aug. 7.4	42.50 −.03	53.8 0.3	22.32 .56	82.0 2.8	48.62 −.04	60.3 1.6	30.28 −.01	8.7 0.0
17.4	42.44 .08	54.2 0.4	21.70 .68	84.6 2.5	48.56 .08	61.7 1.4	30.25 .06	8.7 −0.1
27.4	42.35 .11	54.5 0.4	20.97 .77	86.9 2.1	48.46 .12	63.0 1.1	30.17 .10	8.8 0.1
Sept. 6.3	42.22 .14	54.9 0.3	20.16 .85	88.8 1.6	48.33 .14	63.9 0.8	30.06 .13	9.0 0.2
16.3	42.06 .17	55.2 0.2	19.28 .91	90.2 1.2	48.17 .16	64.6 0.5	29.92 .15	9.1 0.2
26.3	41.89 .18	55.4 0.2	18.35 .94	91.1 0.7	48.00 .18	65.0 +0.3	29.76 .16	9.3 0.2
Oct. 6.2	41.71 .18	55.5 −0.1	17.40 .95	91.5 +0.1	47.82 .18	65.1 0.0	29.60 .17	9.5 0.2
16.2	41.53 .17	55.5 0.0	16.45 .94	91.4 −0.4	47.65 .17	64.9 −0.3	29.43 .16	9.6 0.1
26.2	41.38 .15	55.4 +0.1	15.53 .90	90.7 1.0	47.48 .15	64.4 0.7	29.27 .14	9.7 0.1
Nov. 5.2	41.25 .11	55.2 0.2	14.65 .84	89.5 1.5	47.34 .13	63.6 0.9	29.14 .12	9.8 0.1
15.1	41.15 .07	54.9 0.3	13.86 .75	87.7 2.0	47.23 .10	62.5 1.2	29.04 .09	9.9 −0.1
25.1	41.10 −.03	54.6 0.3	13.17 .63	85.5 2.4	47.15 .06	61.2 1.4	28.97 −.05	9.9 0.0
Dec. 5.1	41.09 +.02	54.3 0.4	12.60 .50	82.9 2.8	47.11 −.02	59.6 1.7	28.95 .00	9.9 0.0
15.0	41.13 .07	53.9 0.4	12.17 .36	79.9 3.1	47.12 +.03	57.9 1.8	28.97 +.04	10.0 0.0
25.0	41.23 .12	53.5 0.4	11.89 .20	76.6 3.4	47.16 .07	56.0 2.0	29.03 .09	10.0 0.0
35.0	41.36 +.16	53.2 +0.4	11.78 −.03	73.2 −3.5	47.25 +.11	54.0 −2.0	29.13 +.13	10.0 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*δ Draconis.		*τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	° ′ +67 26	h m 19 17	° ′ +73 7	h m 19 19	° ′ +2 52	h m 19 30	° ′ −7 17
	s	″	s	″	s	″	s	″
Jan. 0.0	27.42 −.07	37.0 −3.4	49.17 −.16	30.7 −3.3	16.69 +.09	8.4 −1.3	15.41 +.08	64.6 −0.7
10.0	27.41 +.04	33.5 3.5	49.08 −.01	27.3 3.5	16.80 .12	7.0 1.4	15.51 .12	65.4 0.7
20.0	27.50 .15	30 1 3.4	49.15 +.13	23.9 3.4	16.94 .16	5.7 1.3	15.65 .15	66.1 0.7
29.9	27.70 .25	26.7 3.2	49.35 .27	20.5 3.3	17.11 .19	4.4 1.2	15.82 .19	66.7 0.6
Feb. 8.9	27.99 .34	23.6 2.9	49.69 .40	17.4 3.0	17.31 .22	3.3 1.0	16.02 .21	67.2 0.5
18.9	28.38 .43	20.9 2.5	50.15 .52	14.6 2.6	17.54 .24	2.4 0.8	16.24 .24	67.6 0.3
28.9	28.84 .50	18.6 2.0	50.72 .62	12.2 2.1	17.79 .26	1.8 0.5	16.49 .26	67.7 −0.1
Mar. 10.8	29.37 .55	16.8 1.4	51.38 .69	10.4 1.5	18.06 .28	1.5 −0.2	16.76 .28	67.7 +0.2
20.8	29.94 .59	15.7 0.8	52.10 .75	9.2 0.9	18.34 .29	1.5 +0.2	17.04 .29	67.4 0.4
30.8	30.54 .61	15.3 −0.2	52.86 .78	8.6 −0.2	18.63 .30	1.8 0.4	17.34 .30	66.9 0.6
Apr. 9.7	31.15 .61	15.5 +0.5	53.64 .78	8.7 +0.4	18.93 .30	2.4 0.8	17.65 .31	66.2 0.8
19.7	31.75 .59	16.3 1.2	54.41 .76	9.5 1.1	19.24 .30	3.4 1.1	17.95 .31	65.2 1.0
29.7	32.33 .56	17.8 1.8	55.15 .71	10.8 1.7	19.54 .30	4.6 1.3	18.26 .31	64.1 1.2
May 9.7	32.86 .51	19.8 2.3	55.83 .65	12.8 2.2	19.83 .29	6.0 1.5	18.57 .30	62.9 1.3
19.6	33.34 .44	22.3 2.7	56.43 .56	15.2 2.6	20.11 .27	7.6 1.7	18.86 .29	61.6 1.4
29.6	33.74 .37	25.2 3.1	56.94 .46	18.0 3.0	20.37 .25	9.3 1.8	19.14 .27	60.2 1.4
June 8.6	34.07 .28	28.4 3.3	57.35 .35	21.2 3.3	20.61 .23	11.1 1.8	19.39 .24	58.8 1.4
18.6	34.31 .19	31.9 3.5	57.64 .22	24.5 3.5	20.82 .19	12.9 1.8	19.62 .21	57.5 1.3
28.5	34.45 +.09	35.4 3.6	57.80 +.10	28.1 3.6	21.00 .16	14.7 1.7	19.81 .17	56.2 1.2
July 8.5	34.50 −.01	39.0 3.6	57.83 −.03	31.6 3.6	21.13 .12	16.4 1.6	19.96 .13	55.0 1.1
18.5	34.44 .11	42.5 3.5	57.73 .16	35.2 3.5	21.23 .07	18.0 1.5	20.07 .09	54.0 1.0
28.5	34.29 .20	45.9 3.3	57.51 .29	38.6 3.3	21.28 +.03	19.4 1.3	20.14 +.05	53.1 0.8
Aug. 7.4	34.04 .29	49.1 3.0	57.16 .40	41.8 3.1	21.28 −.02	20.7 1.2	20.17 .00	52.3 0.7
17.4	33.71 .37	51.9 2.7	56.70 .51	44.7 2.8	21.25 .06	21.7 1.0	20.15 −.04	51.8 0.5
27.4	33.30 .45	54.5 2.4	56.14 .61	47.3 2.4	21.17 .09	22.6 0.8	20.09 .08	51.3 0.4
Sept. 6.3	32.82 .51	56.6 1.9	55.50 .69	49.6 2.0	21.07 .12	23.3 0.6	19.99 .11	51.0 0.2
16.3	32.29 .55	58.3 1.5	54.78 .75	51.4 1.6	20.93 .14	23.7 0.4	19.86 .14	50.9 +0.1
26.3	31.72 .58	59.6 1.0	54.01 .79	52.7 1.1	20.78 .16	24.0 +0.2	19.72 .15	50.8 0.0
Oct. 6.3	31.13 .60	60.3 +0.4	53.20 .81	53.6 +0.6	20.62 .16	24.1 0.0	19.56 .16	50.9 −0.1
16.2	30.53 .60	60.4 −0.1	52.39 .81	53.9 0.0	20.46 .16	23.9 −0.2	19.40 .16	51.0 0.2
26.2	29.94 .58	60.1 0.7	51.58 .79	53.6 −0.5	20.30 .15	23.6 0.4	19.25 .14	51.3 0.3
Nov. 5.2	29.39 .54	59.1 1.2	50.81 .75	52.9 1.1	20.17 .12	23.1 0.6	19.12 .12	51.6 0.4
15.2	28.87 .48	57.7 1.7	50.09 .68	51.5 1.6	20.06 .09	22.4 0.8	19.01 .09	52.1 0.5
25.1	28.43 .41	55.7 2.2	49.45 .60	49.6 2.1	19.98 .06	21.5 1.0	18.93 .06	52.6 0.6
Dec. 5.1	27.05 .33	53.2 2.7	48.90 .49	47.3 2.6	19.94 −.02	20.4 1.1	18.89 −.02	53.2 0.6
15.1	27.77 .23	50.4 3.0	48.47 .37	44.6 2.9	19.94 +.02	19.3 1.2	18.88 +.02	53.8 0.7
25.0	27.59 .13	47.2 3.3	48.16 .24	41.5 3.2	19.98 .06	18.0 1.3	18.92 .06	54.5 0.7
35.0	27.50 −.03	43.9 −3.4	47.99 −.10	38.2 −3.4	20.06 +.10	16.7 −1.4	19.00 +.10	55.2 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		*ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	° ′ +10 18	h m 19 44	° ′ +8 32	h m 19 48	° ′ +69 56	h m 19 49	° ′ +6 5
	s	″	s	″	s	″	s	″
Jan. 0.0	23.62 +.06	47.0 −1.7	45.83 +.06	34.8 −1.6	30.26 −.18	74.1 −3.2	15.22 +.06	56.7 −1.5
10.0	23.70 .10	45.3 1.7	45.91 .09	33.3 1.6	30.13 −.07	70.8 3.4	15.29 .09	55.3 1.5
20.0	23.81 .13	43.6 1.7	46.02 .13	31.7 1.5	30.12 +.05	67.4 3.4	15.40 .12	53.8 1.4
30.0	23.96 .16	42.0 1.5	46.16 .16	30.2 1.4	30.23 .17	64.0 3.3	15.54 .16	52.5 1.3
Feb. 8.9	24.14 .19	40.6 1.3	46.34 .19	28.9 1.2	30.45 .28	60.8 3.1	15.71 .19	51.3 1.1
18.9	24.35 .22	39.3 1.1	46.54 .22	27.7 1.0	30.79 .39	57.8 2.8	15.92 .22	50.2 0.9
28.9	24.58 .24	38.4 0.8	46.77 .24	26.9 0.7	31.22 .48	55.2 2.4	16.14 .24	49.5 0.6
Mar. 10.9	24.83 .26	37.8 −0.4	47.02 .26	26.4 −0.3	31.74 .56	53.1 1.8	16.39 .26	49.1 −0.2
20.8	25.10 .28	37.6 0.0	47.29 .27	26.2 0.0	32.33 .62	51.6 1.2	16.66 .27	49.0 +0.1
30.8	25.39 .29	37.8 +0.4	47.58 .29	26.5 +0.4	32.97 .66	50.7 −0.6	16.94 .29	49.2 0.4
Apr. 9.8	25.69 .30	38.3 0.8	47.88 .30	27.0 0.8	33.63 .67	50.4 +0.1	17.23 .30	49.8 0.8
19.7	25.99 .31	39.3 1.1	48.18 .31	28.0 1.1	34.31 .67	50.8 0.7	17.54 .31	50.7 1.1
29.7	26.30 .30	40.6 1.5	48.49 .30	29.3 1.4	34.97 .65	51.8 1.3	17.84 .30	52.0 1.4
May 9.7	26.60 .30	42.2 1.7	48.79 .30	30.9 1.7	35.60 .61	53.5 1.9	18.14 .30	53.5 1.6
19.7	26.88 .28	44.0 1.9	49.08 .29	32.7 1.9	36.18 .55	55.6 2.4	18.44 .29	55.2 1.8
29.6	27.16 .26	46.0 2.1	49.36 .27	34.6 2.1	36.70 .48	58.2 2.8	18.71 .27	57.1 1.9
June 8.6	27.41 .24	48.1 2.2	49.61 .24	36.7 2.1	37.13 .39	61.2 3.2	18 97 .25	50.1 2.0
18.6	27.63 .21	50.3 2.2	49.64 .21	38.8 2.1	37.48 .29	64.5 3.4	19.20 .22	61.1 2.0
28.6	27.82 .17	52.5 2.2	50.03 .17	40.9 2.1	37.72 .19	68.0 3.6	19.40 .18	63.1 2.0
July 8.5	27.97 .13	54.6 2.1	50.19 .14	43.0 2.0	37.85 +.08	71.6 3.6	19.56 .14	65.0 1.9
18.5	28.07 .09	56.6 2.0	50.30 .09	44.9 1.9	37.88 −.03	75.3 3.6	19.68 .10	66.8 1.7
28.5	28.14 +.04	58.5 1.8	50.37 +.05	46.8 1.7	37.79 .14	78.8 3.5	19.75 .05	68.5 1.6
Aug. 7.4	28.15 .00	60.2 1.6	50.40 .00	48.4 1.5	37.60 .24	82.2 3.3	19.78 +.01	70.0 1.4
17.4	28.13 −.05	61.7 1.4	50.38 −.04	49.8 1.3	37.30 .34	85.5 3.1	19.77 −.03	71.3 1.2
27.4	28.06 .08	62.9 1.1	50.32 .08	51.0 1.1	36.91 .43	88.4 2.8	19.72 .07	72.3 1.0
Sept. 6.4	27.96 .12	63.9 0.9	50.22 .12	52.0 0.8	36.44 .51	91.0 2.4	19.63 .11	73.2 0.8
16.3	27.83 .14	64.7 0.6	50.10 .14	52.7 0.6	35.90 .57	93.2 2.0	19.51 .13	73.9 0.5
26.3	27.68 .16	65.2 0.4	49.95 .15	53.2 0.4	35.30 .62	95.0 1.5	19.37 .15	74.3 0.3
Oct. 6.3	27.52 .17	65.5 +0.1	49.79 .16	53.5 +0.1	34.66 .65	96.3 1.0	19.21 .16	74.5 +0.1
16.3	27.35 .17	65.4 −0.2	49.63 .16	53.5 −0.1	34.00 .67	97.1 +0.5	19.05 .16	74.4 −0.2
26 2	27.19 .16	65.2 0.4	49.47 .15	53.2 0.4	33.34 .66	97.3 −0.1	18.89 .15	74.2 0.4
Nov. 5.2	27.04 .14	64.6 0.7	49.32 .13	52.7 0.6	32.69 .63	96.9 0.6	18.75 .14	73.7 0.6
15.2	26.91 .11	63.8 0.9	49.20 .11	52.0 0.9	32.08 .59	96.0 1.2	18.62 .11	73.0 0.8
25.1	26.82 .08	62.8 1.1	49.11 .08	51.0 1.1	31.52 .53	94.5 1.7	18.53 .08	72.1 1.0
Dec. 5.1	26.76 .04	61.6 1.4	49.04 .04	49.9 1.3	31.02 .45	92.5 2.2	18.46 .05	71.0 1.2
15.1	26.73 −.01	60.1 1.5	49.02 −.01	48.5 1.4	30.62 .36	90.1 2.7	18.44 −.01	69.8 1.3
25.0	26.74 +.03	58.6 1.6	49.03 +.03	47.1 1.5	30.31 .25	87.3 3.0	18.45 +.03	68.4 1.4
35.0	26.80 +.08	56.9 −1.7	49.08 +.07	45.5 −1.6	30.12 −.12	84.1 −3.3	18.49 +.07	67.0 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		*κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 58	° ′ +6 55	h m 20 11	° ′ −12 55	h m 20 12	° ′ +77 20	h m 20 15	° ′ −57 7
	s	″	s	″	s	″	s	″
Jan. 0.1	6.85 +.05	49.9 −1.4	12.83 +.05	37.0 −0.3	52.61 −.46	25.0 −2.9	53.43 +.03	49.1 +2.2
10.0	6.91 .08	48.4 1.5	12.90 .08	37.3 0.3	52.23 .28	21.9 3.2	53.50 .10	46.8 2.4
20.0	7.01 .12	47.0 1.4	13.00 .12	37.6 0.2	52.05 −.09	18.6 3.3	53.63 .17	44.3 2.5
30.0	7.14 .15	45.6 1.3	13.13 .15	37.7 −0.1	52.05 +.10	15.3 3.3	53.83 .23	41.9 2.5
Feb. 8.9	7.31 .18	44.4 1.1	13.30 .18	37.7 0.0	52.24 .29	12.0 3.2	54.10 .29	39.4 2.5
18.9	7.50 .21	43.4 0.9	13.50 .21	37.6 +0.2	52.61 .46	8.9 3.0	54.41 .34	37.0 2.4
28.9	7.72 .23	42.6 0.6	13.72 .23	37.4 0.3	53.16 .62	6.1 2.6	54.78 .39	34.7 2.3
Mar. 10.9	7.96 .25	42.1 −0.3	13.96 .26	37.0 0.5	53.85 .76	3.8 2.1	55.19 .43	32.5 2.1
20.8	8.22 .27	42.0 +0.1	14.23 .28	36.3 0.7	54.67 .87	1.9 1.6	55.64 .47	30.5 1.9
30.8	8.50 .29	42.3 0.4	14.52 .29	35.5 0.9	55.59 .95	0.6 1.0	56.12 .49	28.7 1.7
Apr. 9.8	8.79 .30	42.9 0.8	14.82 .31	34.6 1.1	56.56 1.00	0.0 −0.3	56.62 .51	27.2 1.4
19.8	9.10 .31	43.8 1.1	15.13 .32	33.5 1.2	57.57 1.01	0.0 +0.3	57.14 .53	25.9 1.1
29.7	9.40 .31	45.1 1.4	15.45 .32	32.2 1.3	58.58 .99	0.6 0.9	57.67 .53	25.0 0.8
May 9.7	9.71 .30	46.6 1.7	15.77 .32	30.9 1.4	59.55 .94	1.9 1.5	58.21 .53	24.3 0.5
19.7	10.00 .29	48.4 1.9	16.08 .31	29.5 1.4	60.45 .86	3.7 2.1	58.73 .51	24.0 +0.1
29.6	10.29 .27	50.3 2.0	16.39 .30	28.2 1.4	61.26 .76	6.0 2.5	59.23 .49	24.1 −0.2
June 8.6	10.55 .25	52.3 2.1	16.68 .28	26.8 1.3	61.95 .63	8.7 2.9	59.70 .45	24.5 0.6
18.6	10.79 .22	54.4 2.1	16.94 .25	25.6 1.2	62.51 .48	11.8 3.2	60.13 .41	25.3 0.9
28.6	10.99 .19	56.4 2.1	16.17 .21	24.4 1.1	62.91 .33	15.2 3.5	60.51 .35	26.3 1.2
July 8.5	11.16 .15	58.5 2.0	17.37 .18	23.4 0.9	63.16 +.16	18.7 3.6	60.82 .28	27.7 1.5
18.5	11.28 .10	60.4 1.8	17.52 .13	22.6 0.8	63.24 −.01	22.3 3.6	61.07 .21	29.3 1.7
28.5	11.37 .06	62.1 1.7	17.63 .09	21.9 0.6	63.15 .17	25.9 3.6	61.24 .13	31.1 1.9
Aug. 7.5	11.40 +.02	63.7 1.5	17.69 +.04	21.4 0.4	62.89 .34	29.5 3.5	61.33 +.05	33.0 1.9
17.4	11.40 −.03	65.1 1.3	17.71 −.01	21.1 0.3	62.48 .49	32.9 3.3	61.34 −.03	35.0 2.0
27.4	11.35 .07	66.2 1.1	17.68 .05	20.9 +0.1	61.92 .63	36.1 3.1	61.27 .10	36.9 1.9
Sept. 6.4	11.27 .10	67.2 0.8	17.62 .08	20.9 0.0	61.22 .76	39.0 2.8	61.14 .17	38.7 1.7
16.3	11.15 .13	67.9 0.6	17.51 .12	20.9 −0.1	60.41 .87	41.6 2.4	60.94 .23	40.4 1.5
26.3	11.01 .15	68.3 0.4	17.39 .14	21.1 0.2	59.50 .96	43.8 2.0	60.69 .27	41.8 1.2
Oct. 6.3	10.86 .16	68.6 +0.1	17.24 .15	21.3 0.2	58.51 1.02	45.5 1.5	60.40 .30	42.8 0.9
16.3	10.70 .16	68.6 −0.1	17.09 .10	21.5 0.3	57.47 1.06	46.7 1.0	60.09 .31	43.5 0.5
26.2	10.54 .15	68.4 0.3	16.94 .15	21.8 0.3	56.40 1.07	47.4 +0.4	59.78 .31	43.8 −0.1
Nov. 5.2	10.39 .14	68.0 0.6	16.79 .14	22.2 0.3	55.34 1.05	47.6 −0.2	59.48 .29	43.7 +0.4
15.2	10.27 .11	67.3 0.8	16.67 .11	22.5 0.3	54.30 1.01	47.1 0.7	59.20 .25	43.1 0.8
25.2	10.17 .09	66.4 1.0	16.57 .08	22.8 0.3	53.33 .93	46.1 1.3	58.97 .21	42.1 1.2
Dec. 5.1	10.10 .05	65.4 1.1	16.50 .05	23.1 0.3	52.44 .83	44.5 1.8	58.79 .15	40.7 1.6
15.1	10.06 −.02	64.1 1.3	16.47 −.01	23.5 0.3	51.67 .71	42.5 2.3	58.68 .08	39.0 1.9
25.1	10.07 +.02	62.8 1.4	16.47 +.02	23.8 0.3	51.03 .56	40.0 2.7	58.63 −.01	37.0 2.1
35.0	10.11 +.06	61.4 −1.4	16.51 +.06	24.1 −0.3	50.56 −.39	37.1 −3.1	58.65 +.06	34.8 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Capricorni.		ε Delphini.		*Groombridge 3241.		α Cygni.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 20	° ′ -18 36	h m 20 27	° ′ +10 52	h m 20 30	° ′ +72 6	h m 20 37	° ′ +44 50
	s	″	s	″	s	″	s	″
Jan. 0.1	15.91 +.04	57.2 +0.1	19.15 +.02	66.5 −1.5	26.49 −.34	57.1 −2.9	12.52 −.07	30.5 −2.6
10.0	15.97 .08	57.2 0.1	19.19 .05	64.9 1.6	26.22 .21	54.1 3.1	12.48 −.02	27.8 2.8
20.0	16.07 .11	57.0 0.2	19.25 .08	63.4 1.6	26.07 −.08	50.9 3.3	12.48 +.03	24.9 2.9
30.0	16.20 .15	56.8 0.3	19.35 .12	61.9 1.5	26.05 +.05	47.6 3.3	12.54 .08	22.0 2.9
Feb. 9.0	16.36 .18	56.4 0.4	19.49 .15	60.5 1.3	26.17 .18	44.3 3.2	12.65 .13	19.1 2.8
18.9	16.56 .21	56.0 0.5	19.65 .18	59.3 1.1	26.41 .31	41.1 3.0	12.80 .18	16.4 2.5
28.9	16.78 .23	55.4 0.7	19.84 .21	58.4 0.8	26.78 .42	38.2 2.7	13.01 .23	14.1 2.2
Mar. 10.9	17.02 .26	54.7 0.8	20.07 .23	57.7 0.5	27.25 .53	35.8 2.2	13.25 .27	12.1 1.7
20.9	17.29 .28	53.8 0.9	20.31 .26	57.5 −0.1	27.83 .62	33.8 1.7	13.54 .31	10.6 1.2
30.8	17.58 .30	52.8 1.1	20.58 .28	57.6 +0.3	28.48 .68	32.4 1.1	13.86 .34	9.7 0.7
Apr. 9.8	17.89 .31	51.7 1.2	20.86 .29	58.1 0.7	29.18 .73	31.6 −0.5	14.21 .36	9.3 −0.1
19.8	18.20 .32	50.5 1.2	21.16 .30	59.0 1.1	29.92 .75	31.4 +0.2	14.58 .38	9.5 +0.5
29.7	18.53 .33	49.2 1.3	21.47 .31	60.2 1.4	30.67 .75	31.9 0.8	14.96 .38	10.3 1.1
May 9.7	18.86 .33	47.9 1.3	21.78 .31	61.7 1.7	31.40 .72	33.0 1.4	15.34 .38	11.7 1.6
19.7	19.19 .32	46.6 1.3	22.09 .30	63.6 1 9	32.10 .68	34.8 2.0	15.71 .36	13.6 2.1
29.7	19.51 .31	45.4 1.2	22.38 .29	65.6 2.1	32.74 .61	36.9 2.4	16.06 .34	15.9 2.5
June 8.6	19.81 .29	44.2 1.1	22.66 .27	67.7 2.2	33.31 .52	39.6 2.9	16.39 .31	18.6 2.9
18.6	20.08 .26	43.2 1.0	22.92 .24	70.0 2.3	33.79 .43	42.6 3.2	16.69 .27	21.6 3.1
28.6	20.33 .23	42.3 0.8	23.14 .21	72.3 2.3	34.17 .32	45.9 3.4	16.94 .23	24.8 3.3
July 8.6	20.54 .19	41.6 0.6	23.33 .17	74.5 2.2	34.44 .21	49.5 3.6	17.14 .18	28.2 3.4
18.5	20.71 .15	41.1 0.5	23.48 .13	76.7 2.1	34.58 +.09	53.1 3.7	17.29 .12	31.6 3.4
28.5	20.83 .10	40.7 0.3	23.59 .09	78.7 2.0	34.61 −.04	56.8 3.7	17.38 .06	35.0 3.4
Aug. 7.5	20.90 .05	40.5 +0.1	23.65 +.04	80.6 1.8	34.51 .16	60.5 3.6	17.42 +.01	38.3 3.2
17.4	20.93 +.01	40.5 0.0	23.67 −.01	82.3 1.6	34.30 .27	64.0 3.4	17.40 −.05	41.4 3.0
27.4	20.91 −.04	40.6 −0.2	23.65 .05	83.7 1.3	33.98 .38	67.3 3.2	17.32 .10	44.3 2.8
Sept. 6.4	20.85 .06	40.8 0.3	23.58 .08	84.9 1.1	33.55 .47	70.4 2.9	17.20 .15	46.9 2.5
16.4	20.76 .11	41.1 0.3	23.48 .11	85.9 0.8	33.04 .56	73.2 2.6	17.03 .19	49.2 2.1
26.3	20.63 .14	41.5 0.4	23.35 .14	86.6 0.6	32.44 .63	75.5 2.1	16.82 .22	51.1 1.7
Oct. 6.3	20.49 .15	41.9 0.4	23.21 .15	87.0 0.3	31.79 .68	77.4 1.7	16.59 .24	52.6 1.3
16.3	20.33 .16	42.2 0.4	23.06 .16	87.2 +0.1	31.10 .71	78.8 1.2	16.34 .26	53.6 0.8
26.3	20.17 .15	42.6 0.3	22.90 .16	87.2 −0.2	30.38 .73	79.8 +0.6	16.08 .26	54.1 +0.2
Nov. 5.2	20.02 .14	42.9 0.3	22.75 .15	86.8 0.5	29.65 .72	80.1 0.0	15.82 .25	54.1 −0.2
15.2	19.89 .12	43.1 0.2	22.61 .13	86.2 0.7	28.94 .70	79.8 −0.5	15.58 .24	53.7 0.7
25.2	19.79 .09	43.3 0.2	22.49 .10	85.4 0.9	28.27 .65	79.0 1.1	15.36 .21	52.7 1 2
Dec. 5.1	19.71 .06	43.5 −0.1	22.40 .07	84.4 1.2	27.65 .58	77.6 1.7	15.16 .18	51.3 1.7
15.1	19.67 −.02	43.5 0.0	22.35 .04	83.1 1.3	27.10 .50	75.7 2.2	15.00 .14	49.4 2.1
25.1	19.67 +.02	43.5 0.0	22.32 −.01	81.7 1.5	26.65 .40	73.3 2.6	14.88 .10	47.1 2.4
35.1	19.71 +.05	43.5 +0.1	22.33 +.03	80.2 −1.5	26.31 −.29	70.5 −3.0	14.81 −.05	44.5 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Aquarii.				ν Cygni.				*12 Year Cat. 1879.				61 Cygni (*pr.*)			
	Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
	h m 20 46		° ′ −9 26		h m 20 52		° ′ +40 41		h m 20 52		° ′ +80 5		h m 21 1		° ′ +38 8	
	s		″		s		″		s		″		s		″	
Jan. 0.1	0.28	+.02	43.6	−0.5	33.66	−.07	42.9	−2.5	57.55	−.79	29.2	−2.6	21.64	−.06	46.1	−2.2
10.1	0.31	.05	44.0	0.4	33.61	−.03	40.3	2.7	56.86	.59	26.4	2.9	21.60	−.02	43.8	2.4
20.0	0.38	.08	44.4	0.3	33.61	+.02	37.6	2.7	56.38	.36	23.4	3.1	21.60	+.03	41.3	2.5
30.0	0.47	.11	44.7	0.2	33.65	.07	34.9	2.7	56.14	−.12	20.2	3.3	21.65	.07	38.7	2.6
Feb. 9.0	0.60	.14	44.8	−0.1	33.74	.11	32.2	2.6	56.14	+.12	16.9	3.3	21.74	.11	36.2	2.5
19.0	0.76	.17	44.8	+0.1	33.88	.16	29.6	2.4	56.39	.36	13.7	3.1	21.87	.16	33.9	2.2
28.9	0.95	.20	44.6	0.3	34.06	.20	27.3	2.1	56.87	.59	10.7	2.9	22.05	.20	31.8	1.9
Mar. 10.9	1.16	.23	44.2	0.5	34.28	.24	25.4	1.7	57.56	.79	8.0	2.5	22.27	.24	30.0	1.5
20.9	1.40	.25	43.6	0.7	34.54	.28	24.0	1.2	58.44	.97	5.8	2.0	22.53	.28	28.7	1.1
30.8	1.66	.27	42.8	0.9	34.84	.31	23.0	0.7	59.48	1.10	4.0	1.5	22.82	.31	27.9	−0.6
Apr. 9.8	1.94	.29	41.7	1.1	35.17	.34	22.7	−0.1	60.63	1.20	2.9	0.9	23.14	.33	27.6	0.0
19.8	2.24	.31	40.5	1.3	35.51	.35	22.8	+0.5	61.87	1.26	2.3	−0.3	23.49	.35	27.8	+0.5
29.8	2.55	.32	39.1	1.5	35.87	.36	23.6	1.0	63.14	1.27	2.4	+0.4	23.84	.37	28.6	1.1
May 9.7	2.87	.32	37.6	1.6	36.24	.36	24.8	1.5	64.40	1.24	3.1	1.0	24.21	.37	29.9	1.6
19.7	3.19	.32	36.1	1.6	36.60	.36	26.6	2.0	65.61	1.17	4.4	1.6	24.58	.36	31.8	2.0
29.7	3.50	.31	34.4	1.6	36.95	.34	28.8	2.4	66.73	1.07	6.2	2.1	24.93	.35	34.0	2.4
June 8.7	3.80	.29	32.8	1.6	37.27	.31	31.4	2.8	67.74	.94	8.5	2.6	25.27	.32	36.6	2.8
18.6	4.08	.27	31.3	1.5	37.57	.28	34.3	3.0	68.60	.77	11.3	2.9	25.58	.29	39.5	3.0
28.6	4.34	.24	29.9	1.4	37.84	.24	37.4	3.2	69.28	.59	14.4	3.3	25.86	.26	42.6	3.2
July 8.6	4.56	.20	28.5	1.3	38.05	.19	40.7	3.3	69.78	.40	17.8	3.5	26.09	.21	45.9	3.3
18.5	4.74	.16	27.4	1.1	38.22	.14	44.0	3.3	70.08	+.19	21.3	3.6	26.28	.16	49.2	3.3
28.5	4.88	.12	26.4	0.9	38.34	.09	47.3	3.3	70.17	−.01	25.0	3.7	26.42	.11	52.6	3.3
Aug. 7.5	4.97	.07	25.6	0.7	38.40	+.04	50.5	3.1	70.05	.22	28.7	3.7	26.50	.06	55.8	3.2
17.5	5.02	+.03	25.1	0.5	38.41	−.02	53.6	3.0	69.73	.42	32.3	3.6	27.54	+.01	58.9	3.0
27.4	5.02	−.02	24.6	0.3	38.36	.07	56.4	2.7	69.22	.61	35.8	3.4	26.52	−.04	61.8	2.8
Sept. 6.4	4.99	.06	24.4	+0.2	38.27	.12	59.0	2.4	68.51	.79	39.1	3.2	26.46	.09	64.4	2.5
16.4	4.91	.09	24.3	0.0	38.13	.15	61.3	2.1	67.65	.94	42.2	2.9	26.35	.13	66.7	2.2
26.4	4.81	.12	24.4	−0.1	37.96	.19	63.2	1.7	66.63	1.08	44.9	2.5	26.20	.16	68.7	1.8
Oct. 6.3	4.68	.14	24.5	0.2	37.77	.21	64.7	1.3	65.50	1.19	47.2	2.1	26.03	.18	70.3	1.4
16.3	4.54	.15	24.8	0.3	37.55	.23	65.8	0.9	64.26	1.27	49.1	1.6	25.84	.20	71.5	1.0
26.3	4.39	.15	25.1	0.3	37.32	.23	66.4	+0.4	62.96	1.32	50.4	1.1	25.64	.21	72.4	0.5
Nov. 5.3	4.25	.14	25.5	0.4	37.09	.23	66.5	−0.1	61.63	1.34	51.2	+0.5	25.43	.20	72.6	+0.1
15.2	4.12	.12	25.9	0.4	36.87	.21	66.2	0.6	60.29	1.33	51.5	−0.1	25.23	.19	72.4	−0.4
25.2	4.01	.10	25.3	0.5	36.67	.19	65.4	1.0	58.98	1.28	51.1	0.6	25.05	.17	71.8	0.9
Dec. 5.2	3.92	.07	26.8	0.5	36.49	.17	64.2	1.5	57.75	1.19	50.2	1.2	24.89	.15	70.7	1.3
15.1	3.87	.04	27.3	0.5	36.34	.13	62.5	1.9	56.62	1.06	48.7	1.8	24.76	.12	69.2	1.7
25.1	3.84	−.01	27.7	0.5	36.22	.09	60.4	2.3	55.64	.90	46.7	2.3	24.66	.08	67.3	2.0
35.1	3.85	+.02	28.2	−0.4	36.15	−.05	58.0	−2.5	54.83	−.72	44.2	−2.7	24.59	−.04	65.1	−2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.		α Cephei.		1 Pegasi.		β Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 7	° ′ +29 43	h m 21 15	° ′ +62 3	h m 21 16	° ′ +19 16	h m 21 25	° ′ −6 6
	s	″	s	″	s	″	s	″
Jan. 0.1	40.87 −.05	24.9 −2.1	35.69 −.24	58.6 −2.4	22.99 −.04	45.5 −1.6	4.33 −.01	45.9 −0.6
10.1	40.84 −.01	22.7 2.2	35.49 .17	56.0 2.8	22.96 −.01	43.8 1.8	4.33 +.02	46.4 0.5
20.1	40.84 +.02	20.5 2.3	35.36 .10	53.0 3.0	22.98 +.03	42.0 1.8	4.36 .04	46.9 0.4
30.0	40.86 .06	18.2 2.3	35.30 −.02	49.9 3.2	23.02 .06	40.2 1.8	4.41 .07	47.2 0.3
Feb. 9.0	40.96 .10	15.9 2.2	35.32 +.06	46.8 3.2	23.10 .10	38.4 1.7	4.49 .10	47.5 −0.2
19.0	41.08 .14	13.8 2.0	35.43 .15	43.6 3.0	23.21 .13	36.9 1.5	4.61 .13	47.6 0.0
28.9	41.24 .18	11.9 1.7	35.62 .23	40.7 2.8	23.36 .16	35.5 1.2	4.76 .16	47.5 +0.2
Mar. 10.9	41.43 .21	10.4 1.3	35.88 .30	38.1 2.4	23.54 .20	34.5 0.9	4.93 .19	47.2 0.4
20.9	41.66 .25	9.3 0.9	36.22 .37	35.9 2.0	23.75 .23	33.8 0.5	5.14 .22	46.6 0.7
30.9	41.92 .28	8.7 −0.4	36.62 .43	34.2 1.4	23.99 .26	33.5 −0.1	5.37 .25	45.8 0.9
Apr. 9.8	42.20 .30	8.5 +0.1	37.07 .48	33.1 0.8	24.26 .28	33.7 +0.4	5.63 .27	44.8 1.1
19.8	42.51 .32	8.8 0.6	37.57 .51	32.6 −0.2	24.55 .30	34.2 0.8	5.91 .29	43.5 1.4
29.8	42.84 .33	9.6 1.1	38.09 .53	32.7 +0.4	24.86 .31	35.2 1.2	6.21 .31	42.1 1.5
May 9.8	43.17 .34	10.9 1.5	38.62 .53	33.4 1.0	25.18 .32	36.6 1.6	6.52 .32	40.5 1.7
19.7	43.51 .33	12.7 1.9	39.14 .52	34.7 1.6	25.51 .32	38.4 1.9	6.84 .32	38.7 1.8
29.7	43.84 .32	14.8 2.3	39.65 .49	36.6 2.1	25.82 .32	40.4 2.2	7.16 .32	36.9 1.8
June 8.7	44.16 .31	17.2 2.6	40.12 .45	39.0 2.6	26.13 .30	42.7 2.4	7.47 .31	35.1 1.8
18.6	44.45 .28	19.9 2.8	40.55 .40	41.7 3.0	26.42 .28	45.1 2.5	7.77 .29	33.3 1.8
28.6	44.71 .24	22.7 2.9	40.93 .34	44.9 3.3	26.68 .25	47.7 2.6	8.04 .26	31.6 1.7
July 8.6	44.93 .21	25.7 3.0	41.24 .27	48.3 3.5	26.91 .21	50.3 2.6	8.29 .22	30.0 1.5
18.6	45.12 .16	28.7 3.0	41.47 .19	51.9 3.7	27.10 .17	52.9 2.6	8.50 .19	28.5 1.4
28.5	45.26 .12	31.6 2.9	41.62 .12	55.6 3.7	27.25 .13	55.5 2.5	8.67 .15	27.3 1.1
Aug. 7.5	45.35 .07	34.4 2.8	41.70 +.04	59.3 3.7	27.36 .08	57.9 2.3	8.80 .11	26.2 0.9
17.5	45.39 +.02	37.1 2.6	41.69 −.05	62.9 3.6	27.42 .04	60.1 2.2	8.88 .06	25.3 0.8
27.5	45.38 −.03	39.6 2.4	41.61 .12	66.4 3.4	27.43 +.01	62.2 1.9	8.92 +.02	24.7 0.6
Sept. 6.4	45.33 .07	41.9 2.1	41.45 .19	69.7 3.2	27.40 −.05	64.0 1.7	8.92 −.02	24.2 0.4
16.4	45.24 .11	43.8 1.8	41.23 .26	72.8 2.9	27.34 .08	65.5 1.4	8.88 .06	24.0 +0.2
26.4	45.12 .14	45.5 1.5	40.94 .31	75.5 2.5	27.24 .11	66.7 1.1	8.80 .09	23.9 0.0
Oct. 6.3	44.97 .16	46.7 1.1	40.60 .36	77.8 2.1	27.12 .13	67.7 0.8	8.70 .11	23.9 −0.1
16.3	44.80 .18	47.6 0.7	40.23 .39	79.6 1.6	26.98 .15	68.3 0.5	8.57 .13	24.1 0.2
26.3	44.62 .18	48.2 +0.3	39.82 .41	81.0 1.1	26.82 .16	68.6 +0.2	8.44 .13	24.4 0.3
Nov. 5.3	44.44 .18	48.3 −0.1	39.41 .42	81.8 +0.6	26.67 .15	68.6 −0.2	8.31 .13	24.8 0.4
15.2	44.26 .17	48.0 0.5	38.99 .41	82.1 0.0	26.52 .14	68.3 0.5	8.18 .13	25.3 0.5
25.2	44.10 .15	47.3 0.9	38.59 .40	81.8 −0.6	26.38 .13	67.7 0.8	8.06 .11	25.8 0.5
Dec. 5.2	43.96 .13	46.2 1.3	38.20 .37	80.9 1.2	26.26 .11	66.8 1.1	7.96 .09	26.3 0.6
15.2	43.84 .10	44.8 1.6	37.86 .33	79.5 1.7	26.16 .08	65.6 1.3	7.88 .07	26.9 0.6
25.1	43.75 .07	43.0 1.9	37.56 .27	77.6 2.2	26.09 .06	64.1 1.5	7.83 .04	27.4 0.6
35.1	43.70 −.04	41.0 −2.1	37.31 −.21	75.2 −2.6	26.05 −.03	62.5 −1.7	7.81 −.01	28.0 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β Cephei.		ξ Aquarii.		ε Pegasi.		*11 Cephei.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 21 26	° ′ +70 0	h m 21 31	° ′ −8 24	h m 21 38	° ′ +9 18	h m 21 40	° ′ +70 44
	s	″	s	″	s	″	s	″
Jan. 0.1	59.89 −.40	82.9 −2.3	11.54 −.02	23.4 −0.5	7.97 −.04	41.4 −1.2	2.79 −.44	52.2 −2.1
10.1	59.54 .31	80.4 2.7	11.54 +.01	23.8 0.4	7.94 −.01	40.2 1.2	2.40 .35	49.8 2.6
20.1	59.28 .21	77.5 3.0	11.56 .04	24.2 0.3	7.95 +.02	39.0 1.3	2.10 .25	47.1 2.9
30.0	59.13 −.10	74.5 3.2	11.61 .07	24.4 −0.2	7.98 .05	37.8 1.2	1.90 .14	44.1 3.1
Feb. 9.0	59.09 +.02	71.2 3.2	11.69 .10	24.5 0.0	8.04 .08	36.6 1.1	1.83 −.02	40.9 3.2
19.0	59.17 .14	68.0 3.2	11.80 .13	24.5 +0.2	8.14 .11	35.6 0.9	1.87 +.10	37.7 3.2
Mar. 1.0	59.37 .25	65.0 3.0	11.94 .16	24.2 0.4	8.27 .14	34.8 0.7	2.03 .23	34.6 3.0
10.9	59.67 .36	62.2 2.6	12.11 .19	23.8 0.6	8.42 .18	34.3 0.4	2.31 .34	31.8 2.7
20.9	60.08 .46	59.7 2.2	12.32 .22	23.1 0.8	8.61 .21	34.1 −0.1	2.71 .45	29.2 2.3
30.9	60.59 .54	57.8 1.7	12.55 .24	22.1 1.0	8.84 .24	34.2 +0.3	3.20 .54	27.2 1.8
Apr. 9.9	61.16 .61	56.4 1.1	12.80 .27	21.0 1.2	9.08 .26	34.7 0.6	3.77 .61	25.6 1.3
19.8	61.80 .66	55.6 −0.5	13.08 .29	19.7 1.4	9.36 .28	35.5 1.0	4.41 .67	24.6 0.7
29.8	62.47 .69	55.4 +0.1	13.38 .31	18.2 1.6	9.65 .30	36.6 1.3	5.10 .70	24.3 −0.1
May 9.8	63.16 .69	55.8 0.8	13.69 .32	16.5 1.7	9.96 .31	38.1 1.6	5.81 .72	24.5 +0.6
19.7	63.85 .68	56.9 1.3	14.01 .32	14.8 1.8	10.27 .32	39.8 1.9	6.53 .71	25.4 1.2
29.7	64.51 .65	58.5 1.9	14.34 .32	13.0 1.8	10.59 .32	41.7 2.0	7.23 .68	26.9 1.7
June 8.7	65.13 .60	60.6 2.4	14.65 .31	11.2 1.8	10.90 .31	43.9 2.2	7.89 .64	28.9 2.2
18.7	65.70 .53	63.3 2.8	14.96 .29	9.4 1.7	11.20 .29	46.1 2.3	8.49 .57	31.4 2.7
28.6	66.18 .45	66.2 3.2	15.24 .27	7.8 1.6	11.48 .26	48.3 2.3	9.02 .49	34.2 3.1
July 8.6	66.59 .36	69.6 3.4	15.49 .24	6.2 1.4	11.72 .23	50.6 2.3	9.47 .40	37.5 3.4
18.6	66.89 .26	73.1 3.6	15.71 .20	4.9 1.3	11.94 .20	52.8 2.2	9.82 .30	41.0 3.6
28.5	67.09 .15	76.8 3.7	15.88 .16	3.7 1.1	12.11 .15	54.9 2.0	10.06 .19	44.6 3.7
Aug. 7.5	67.19 +.04	80.6 3.8	16.02 .11	2.8 0.8	12.24 .11	56.9 1.9	10.20 +.08	48.4 3.8
17.5	67.18 −.06	84.3 3.7	16.11 .07	2.1 0.6	12.33 .07	58.7 1.7	10.23 −.03	52.2 3.8
27.5	67.06 .17	88.0 3.6	16.16 +.02	1.5 0.4	12.38 +.02	60.2 1.4	10.15 .13	55.9 3.7
Sept. 6.4	66.85 .26	91.5 3.4	16.16 −.02	1.2 0.2	12.38 −.02	61.5 1.2	9.96 .24	59.5 3.5
16.4	66.54 .35	94.8 3.1	16.12 .06	1.1 +0.1	12.34 .05	62.6 1.0	9.68 .33	62.9 3.3
26.4	66.15 .43	97.7 2.8	16.05 .09	1.1 −0.1	12.27 .08	63.5 0.7	9.31 .40	66.0 2.9
Oct. 6.4	65.69 .49	100.3 2.4	15.95 .11	1.3 0.2	12.17 .11	64.1 0.5	8.86 .48	68.7 2.6
16.3	65.17 .55	102.5 1.9	15.83 .13	1.5 0.3	12.06 .13	64.5 +0.3	8.35 .54	71.1 2.1
26.3	64.60 .58	104.2 1.4	15.70 .13	1.9 0.4	11.92 .14	64.6 0.0	7.79 .58	72.9 1.6
Nov. 5.3	64.01 .60	105.3 0.8	15.56 .13	2.3 0.5	11.79 .14	64.5 −0.2	7.19 .61	74.3 1.1
15.2	63.41 .60	105.9 +0.3	15.44 .13	2.8 0.5	11.65 .13	64.2 0.4	6.57 .62	75.1 +0.5
25.2	62.81 .59	105.9 −0.3	15.32 .11	3.3 0.5	11.53 .12	63.6 0.6	5.95 .61	75.3 −0.1
Dec. 5.2	62.23 .56	105.3 0.9	15.21 .09	3.8 0.5	11.42 .10	62.9 0.8	5.35 .59	74.9 0.7
15.2	61.70 .51	104.1 1.5	15.13 .07	4.3 0.5	11.33 .08	62.0 1.0	4.79 .54	73.9 1.3
25.1	61.22 .44	102.3 2.0	15.08 .04	4.8 0.5	11.26 .06	60.9 1.1	4.27 .48	72.4 1.8
35.1	60.82 −.36	100.1 −2.4	15.05 −.02	5.2 −0.4	11.22 −.03	59.8 −1.2	3.83 −.40	70.3 −2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Capricorni.		*79 Draconis.		α Aquarii.		α Gruis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$21^{h}\ 46^{m}$	$-14^{\circ}\ 7'$	$21^{h}\ 51^{m}$	$+73^{\circ}\ 6'$	$21^{h}\ 59^{m}$	$-0^{\circ}\ 54'$	$22^{h}\ 0^{m}$	$-47^{\circ}\ 32'$
	s	″	s	″	s	″	s	″
Jan. 0.1	34.83 −.04	53.5 −0.2	15.53 −.54	84.6 −2.0	27.40 −.04	63 4 −0.8	28.07 −.10	94.5 +1.4
10.1	34.81 −.01	53.6 −0.1	15.04 .44	82.4 2.5	27.37 −.02	64.2 0.7	27.99 .06	93.0 1.6
20.1	34.82 +.02	53.6 +0.1	14.66 .33	79.7 2.8	27.36 +.01	64.8 0.7	27.96 −.01	91.2 1.9
30.1	34.85 .05	53.5 0.2	14.39 .20	76.8 3.1	27.38 .03	65.5 0.6	27.97 +.04	89.2 2.2
Feb. 9.0	34.92 .08	53.2 0.4	14.25 − 07	73.7 3.2	27.43 .06	66.0 0.4	28.03 .08	86.9 2.4
19.0	35.02 .11	52.7 0.6	14.25 +.07	70.5 3.2	27.51 .09	66.3 −0.3	28.13 .13	84.5 2.5
Mar. 1.0	35.15 .15	52.1 0.7	14.39 .21	67.3 3.1	27.62 .12	66.5 0.0	28.28 .17	81.9 2.6
10.9	35.31 .18	51.3 0.9	14.67 .34	64.4 2.8	27.76 .16	66.4 +0.2	28.48 .22	79.3 2.6
20.9	35.50 .21	50.2 1.1	15.08 .47	61.8 2.4	27.93 .19	66.0 0.5	28.72 .26	76.7 2.6
30.9	35.73 .24	49.0 1.3	15.60 .58	59.6 2.0	28.13 .22	65.4 0.7	29.00 .30	74.0 2.6
Apr. 9.9	35.98 .26	47.6 1.5	16.22 .67	57.9 1.4	28.37 .25	64.6 1.0	29.31 .34	71.5 2.5
19.8	36.25 .29	46.1 1.6	16.92 .73	56.7 0.9	28.63 .27	63.4 1.3	29.67 .37	69.1 2.3
29.8	36.55 .31	44.4 1.7	17.68 .78	56.2 −0.3	28.91 .29	62.0 1.5	30.06 .40	66.9 2.1
May 9.8	36.87 .32	42.7 1.8	18.47 .80	56.2 +0.4	29.21 .31	60.4 1.7	30.47 .42	64.9 1.9
19.8	37.19 .33	40.9 1.8	19.27 .80	56.9 1.0	29.53 .32	58.6 1.9	30.90 .44	63.1 1.6
29.7	37.52 .33	39.1 1.8	20.06 .77	58.2 1.6	29.85 .32	56.7 2.0	31.33 .44	61.7 1.3
June 8.7	37.85 .32	37.3 1.7	20.81 .72	60.0 2.1	30.16 .31	54.7 2.0	31.77 .43	60.6 0.9
18.7	38.16 .31	35.7 1.6	21.50 .65	62.4 2.6	30.47 .30	52.7 2.0	32.19 .41	59.9 0.5
28.6	38.46 .28	34.2 1.4	22.11 .57	65.1 3.0	30.76 .28	50.7 2.0	32.59 .39	59.6 +0.1
July 8.6	38.73 .25	32.9 1.2	22.63 .47	68.2 3.3	31.03 .25	48.8 1.9	32.96 .35	59.7 −0.3
18.6	38.96 .22	31.7 1.0	23.05 .36	71.7 3.5	31.26 .22	47.0 1.7	33.29 .30	60.1 0.6
28.6	39.16 .18	30.8 0.8	23.35 .24	75.3 3.7	31.46 .18	45.4 1.5	33.56 .25	60.9 1.0
Aug. 7.5	39.32 .13	30.2 0.5	23.54 +.12	79.0 3.8	31.61 .14	43.9 1.3	33.78 .19	62.1 1.3
17.5	39.42 .09	29.8 0.3	23.59 .00	82.8 3.8	31.73 .09	42.7 1.1	33.94 .13	63.5 1.5
27.5	39.49 +.04	29.6 +0.1	23.53 −.12	86.6 3.7	31.80 .05	41.7 0.9	34.04 +.06	65.1 1.7
Sept. 6.5	39.51 .00	29.6 −0.1	23.35 .24	90.3 3.6	31.83 +.01	40.9 0.7	34.06 .00	66.9 1.8
16.4	39.48 −.04	29.7 0.2	23.06 .35	93.8 3.4	31.81 −.03	40.4 0.5	34.03 −.06	68.8 1.9
26.4	39.42 .08	30.0 0.4	22.67 .44	97.0 3.1	31.76 .06	40.0 0.3	33.94 .11	70.6 1.8
Oct. 6.4	39.33 .10	30.5 0.5	22.18 .53	99.9 2.7	31.69 .09	39.8 +0.1	33.80 .16	72.4 1.7
16.3	39.22 .12	31.0 0.5	21.62 .60	102.4 2.3	31.59 .11	39.9 −0.1	33.63 .19	73.9 1.5
26.3	39.09 .13	31.5 0.6	20.99 .65	104.5 1.8	31.47 .12	40.0 0.2	33.42 .21	75.3 1.2
Nov. 5.3	38.96 .13	32.1 0.5	20.32 .69	106.0 1.3	31.35 .13	40.3 0.4	33.20 .22	76.3 0.9
15.3	38.83 .13	32.6 0.5	19.62 .71	107.0 0.7	31.22 .12	40.7 0.5	32.98 .22	77.0 0.5
25.2	38.71 .12	33.1 0.5	18.91 .71	107.4 +0.1	31.10 .11	41.2 0.6	32.77 .21	77.2 −0.1
Dec. 5.2	38.60 .10	33.5 0.4	18.21 .69	107.3 −0.5	31.00 .10	41.8 0.6	32.57 .19	77.1 +0.3
15.2	38.51 .08	33.9 0.3	17.54 .64	106.5 1.1	30.90 .08	42.5 0.7	32.39 .16	76.6 0.7
25.2	38.45 .05	34.2 0.2	16.93 .58	105.1 1.7	30.83 .06	43.2 0.7	32.25 .12	75.7 1.1
35.1	38.41 −.02	34.3 −0.1	16.39 −.50	103.2 −2.2	30.78 −.04	44.0 −0.7	32.15 −.09	74.4 +1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aquarii.		π Aquarii.		η Aquarii.		*226 Cephei (B.)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	22h 10m	−8° 23′	22h 18m	+0° 45′	22h 29m	−0° 44′	22h 29m	+75° 35′
	s	″	s	″	s	″	s	″
Jan. 0.2	20.10 −.05	47.4 −0.4	59.23 −.06	11.4 −0.8	1.70 −.07	65.7 −0.7	61.72 −.71	48.0 −1.5
10.1	20.06 −.03	47.7 0.3	59.18 .04	10.7 0.8	1.65 .04	66.3 0.7	61.05 .62	46.3 2.0
20.1	20.05 .00	48.0 0.2	59.16 −.01	9.9 0.7	1.61 −.02	67.0 0.6	60.48 .51	44.1 2.4
30.1	20.06 +.03	48.2 −0.1	59.16 +.02	9.3 0.6	1.61 +.01	67.6 0.5	60.04 .38	41.5 2.8
Feb. 9.0	20.10 .06	48.2 +0.1	59.19 .04	8.7 0.5	1.63 .03	68.0 0.4	59.73 .23	38.5 3.0
19.0	20.17 .09	48.1 0.2	59.25 .07	8.3 0.3	1.67 .06	68.3 −0.2	59.57 −.08	35.4 3.1
Mar. 1.0	20.27 .12	47.7 0.4	59.33 .10	8.1 −0.1	1.75 .09	68.4 0.0	59.58 +.09	32.3 3.1
11.0	20.41 .15	47.2 0.6	59.45 .14	8.1 +0.1	1.86 .13	68.3 +0.2	59.75 .25	29.2 3.0
20.9	20.57 .18	46.4 0.9	59.61 .17	8.4 0.4	2.01 .16	68.0 0.5	60.08 .41	26.4 2.7
30.9	20.77 .21	45.4 1.1	59.80 .20	8.9 0.7	2.19 .20	67.4 0.7	60.56 .55	23.8 2.3
Apr. 9.9	21.00 .24	44.2 1.3	60.02 .23	9.7 0.9	2.40 .23	66.5 1.0	61.18 .68	21.7 1.9
19.9	21.26 .27	42.8 1.5	60.26 .26	10.8 1.2	2.64 .26	65.3 1.3	61.91 .78	20.1 1.4
29.8	21.54 .29	41.2 1.7	60.54 .28	12.1 1.5	2.91 .28	63.9 1.5	62.73 .86	19.0 0.8
May 9.8	21.84 .31	39.4 1.8	60.83 .30	13.7 1.7	3.20 .30	62.3 1.7	63.62 .91	18.6 −0.2
19.8	22.16 .32	37.6 1.9	61.14 .32	15.5 1.9	3.51 .32	60.5 1.9	64.54 .93	18.7 +0.4
29.7	22.48 .32	35.6 1.9	61.46 .32	17.4 2.0	3.83 .32	58.5 2.0	65.47 .92	19.4 1.0
June 8.7	22.80 .32	33.7 1.9	61.78 .32	19.4 2.1	4.15 .32	56.5 2.1	66.38 .89	20.8 1.6
18.7	23.12 .31	31.9 1.8	62.10 .31	21.5 2.1	4.47 .31	54.5 2.1	67.25 .83	22.6 2.1
28.7	23.42 .29	30.1 1.7	62.40 .29	23.6 2.0	4.77 .30	52.4 2.0	68.04 .76	25.0 2.6
July 8.6	23.70 .26	28.4 1.6	62.67 .26	25.6 2.0	5.06 .27	50.5 1.9	68.75 .66	27.7 3.0
18.6	23.94 .23	26.9 1.4	62.92 .23	27.5 1.8	5.31 .24	48.6 1.8	69.35 .54	30.9 3.3
28.6	24.16 .19	25.7 1.2	63.13 .19	29.2 1.7	5.53 .20	46.9 1.6	69.84 .42	34.3 3.5
Aug. 7.5	24.33 .15	24.6 0.9	63.30 .15	30.8 1.5	5.71 .16	45.4 1.4	70.19 .29	37.9 3.7
17.5	24.45 .11	23.8 0.7	63.44 .11	32.2 1.3	5.85 .12	44.2 1.2	70.41 .15	41.7 3.8
27.5	24.54 .06	23.2 0.5	63.52 .07	33.3 1.0	5.95 .08	43.1 1.0	70.49 +.01	45.6 3.8
Sept. 6.5	24.58 +.02	22.9 0.3	63.57 +.03	34.2 0.8	6.01 +.04	42.3 0.7	70.44 −.12	49.4 3.8
16.4	24.58 −.02	22.8 +0.1	63.58 −.01	34.9 0.6	6.03 .00	41.7 0.5	70.25 .25	53.1 3.6
26.4	24.54 .05	22.8 −0.1	63.54 .05	35.3 0.4	6.00 −.04	41.3 0.3	69.94 .37	56.7 3.4
Oct. 6.4	24.47 .08	23.0 0.3	63.48 .08	35.6 +0.2	5.95 .07	41.1 +0.1	69.51 .49	59.9 3.1
16.4	24.37 .10	23.3 0.4	63.40 .10	35.7 0.0	5.87 .09	41.1 −0.1	68.97 .59	62.9 2.8
26.3	24.26 .12	23.7 0.5	63.29 .11	35.6 −0.2	5.77 .11	41.3 0.2	68.34 .67	65.5 2.4
Nov. 5.3	24.14 .12	24.2 0.5	63.18 .12	35.3 0.3	5.66 .11	41.6 0.4	67.64 .74	67.6 1.9
15.3	24.02 .12	24.7 0.5	63.06 .12	34.9 0.5	5.55 .12	42.0 0.5	66.87 .79	69.2 1.3
25.2	23.90 .12	25.3 0.5	62.94 .11	34.4 0.6	5.43 .11	42.5 0.6	66.07 .81	70.3 0.7
Dec. 5.2	23.79 .10	25.8 0.5	62.83 .11	33.9 0.6	5.32 .10	43.1 0.6	65.26 .82	70.7 +0.1
15.2	23.70 .09	26.4 0.5	62.73 .09	33.2 0.7	5.23 .09	43.7 0.7	64.45 .79	70.5 −0.5
25.2	23.62 .07	26.8 0.5	62.65 .07	32.5 0.7	5.14 .08	44.4 0.7	63.68 .75	69.7 1.1
35.1	23.57 −.04	27.3 −0.4	62.59 −.05	31.7 −0.8	5.07 −.06	45.1 −0.7	62.97 −.67	68.3 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Pegasi.		*ι Cephei.		λ Aquarii.		α Piscis Australis. (*Fomalhaut.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$22^{h}\ 35^{m}$	$+10^{\circ}\ 11'$	$22^{h}\ 45^{m}$	$+65^{\circ}\ 32'$	$22^{h}\ 46^{m}$	$-8^{\circ}\ 13'$	$22^{h}\ 50^{m}$	$-30^{\circ}\ 16'$
	s	″	s	″	s	″	s	″
Jan. 0.2	19.10 −.07	24.9 −1.0	15.74 −.39	88.1 −1.4	11.49 −.07	64.7 −0.4	50.97 −.09	35.2 +0.3
10.1	19.03 .05	23.9 1.1	15.38 .34	86.4 1.9	11.43 .05	65.1 0.4	50.89 .07	34.7 0.6
20.1	18.99 .03	22.8 1.1	15.06 .28	84.3 2.3	11.38 .03	65.4 0.2	50.83 .05	34.0 0.9
30.1	18.97 −.01	21.7 1.1	14.81 .21	81.6 2.7	11.37 −.01	65.5 −0.1	50.79 −.02	33.0 1.1
Feb. 9.1	18.98 +.02	20.7 1.0	14.64 .13	79.0 2.9	11.37 +.02	65.5 +0.1	50.79 +.01	31.7 1.4
19.0	19.02 .05	19.7 0.9	14.55 −.05	76.0 3.0	11.41 .05	65.3 0.3	50.82 .06	30.2 1.6
Mar. 1.0	19.08 .09	19.0 0.7	14.55 +.05	73.0 3.0	11.47 .08	65.0 0.5	50.89 .08	28.5 1.8
11.0	19.19 .12	18.4 0.4	14.65 .15	70.0 2.9	11.56 .11	64.4 0.7	50.99 .12	26.6 2.0
20.9	19.32 .16	18.1 −0.1	14.84 .24	67.3 2.6	11.69 .15	63.6 0.9	51.12 .16	24.5 2.1
30.9	19.50 .19	18.1 +0.2	15.13 .33	64.9 2.2	11.86 .18	62.5 1.2	51.30 .20	22.3 2.3
Apr. 9.9	19.70 .22	18.5 0.5	15.51 .41	62.9 1.8	12.06 .22	61.3 1 4	51.51 .23	20.0 2.3
19.9	19.94 .26	19.2 0.9	15.96 .48	61.3 1.3	12.29 .25	59.8 1.6	51.76 .27	17.7 2.3
29.8	20.21 .28	20.2 1.2	16.47 .54	60.4 0.7	12.55 .27	58.1 1.8	52.04 .30	15.4 2.3
May 9.8	20.51 .30	21.5 1.5	17.03 .58	59.9 −0.1	12.83 .30	56.3 1.9	52.36 .33	13.1 2.3
19.8	20.82 .32	23.1 1.7	17.62 .60	60.1 +0.5	13.14 .31	54.3 2.0	52.69 .35	10.9 2.1
29.8	21.14 .32	25.0 2.0	18.22 .61	60.9 1.1	13.46 .32	52.3 2.0	53.04 .36	8.8 2.0
June 8.7	21.46 .32	27.1 2.1	18.83 .60	62.2 1.6	13.79 .33	50.3 2.0	53.40 .36	6.9 1.8
18.7	21.78 .31	29.2 2.2	19.41 .57	64.1 2.1	14.11 .32	48.3 2.0	53.76 .36	5.3 1.5
28.7	22.08 .30	31.5 2.3	19.96 .53	66.4 2.6	14.43 .31	46.4 1.8	54.11 .34	3.9 1.2
July 8.6	22.37 .27	33.8 2.3	20.46 .47	69.2 2.9	14.72 .28	44.7 1.7	54.45 .32	2.9 0.9
18.6	22.63 .24	36.1 2.2	20.89 .40	72.3 3.3	14.99 .25	43.1 1.5	54.75 .29	2.3 0.5
28.6	22.85 .21	38.2 2.1	21.26 .33	75.7 3.5	15.23 .22	41.7 1.3	55.02 .25	1.9 +0.2
Aug. 7.6	23.03 .16	40.3 2.0	21.55 .25	79.2 3.6	15.43 .18	40.6 1.0	55.25 .21	1.9 −0.2
17.5	23.18 .12	42.2 1.8	21.76 .17	82.9 3.7	15.59 .14	39.7 0.8	55.44 .16	2.2 0.5
27.5	23.28 .08	43.9 1.6	21.88 +.08	86.7 3.7	15.70 .10	39.0 0.5	55.57 .12	2.9 0.8
Sept. 6.5	23.34 +.04	45.4 1.4	21.92 .00	90.4 3.7	15.78 .05	38.6 0.3	55.66 .06	3.8 1.0
16.5	23.36 .00	46.6 1.1	21.88 −.09	94.0 3.5	15.81 +.01	38.4 +0.1	55.70 +.02	4.9 1.2
26.4	23.34 −.04	47.6 0.9	21.75 .16	97.4 3.3	15.81 −.02	38.5 −0.1	55.69 −.03	6.1 1.3
Oct. 6.4	23.29 .06	48.4 0.7	21.56 .23	100.6 3.0	15.77 .05	38.7 0.3	55.64 .07	7.4 1.3
16.4	23.21 .09	48.9 0.4	21.30 .29	103.5 2.7	15.70 .08	39.0 0.4	55.56 .10	8.8 1.3
26.3	23.11 .10	49.2 +0.2	20.98 .34	106.0 2.3	15.61 .10	39.5 0.5	55.45 .12	10.1 1.3
Nov. 5.3	23.00 .11	49.3 0.0	20.62 .38	108.0 1.8	15.51 .11	40.1 0.6	55.32 .14	11.3 1.1
15.3	22.88 .12	49.1 −0.3	20.22 .41	109.6 1.3	15.40 .11	40.7 0.6	55.18 .14	12.3 0.9
25.3	22.77 .12	48.8 0.4	19.80 .43	110.5 0.7	15.28 .11	41.3 0.6	55.04 .14	13.1 0.7
Dec. 5.2	22.65 .11	48.2 0.6	19.36 .44	111.0 +0.1	15.17 .11	41.9 0.6	54.90 .14	13.7 0.4
15.2	22.55 .10	47.5 0.8	18.93 .43	110.8 −0.5	15.07 .10	42.5 0.6	54.77 .13	14.0 −0.2
25.2	22.46 .09	46.6 0.9	18.51 .41	110.0 1.0	14.98 .08	43.0 0.5	54.65 .11	14.0 +0.1
35.2	22.38 −.07	45.6 −1.0	18.12 −.37	109.7 −1.6	14.91 −.07	43.4 −0.4	54.55 −.09	13.7 +0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		*α Pegasi. (Markab.)*		*°o Cephei.*		*θ Piscium.*		*ι Piscium.*	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 22 58	° ′ +14 32	h m 23 13	° +67 26	h m 23 21	° ′ +5 42	h m 23 33	° +4 57
		s	″	s	″	s	″	s	″
Jan.	0.2	37.65 −.09	41.9 −1.0	32.59 −.45	35.2 −1.0	43.51 −.09	15.3 −0.8	37.38 −.09	37.1 −0.7
	10.2	37.57 .07	40.8 1.1	32.16 .41	33.9 1.6	43.43 .08	14.5 0.8	37.29 .08	36.4 0.8
	20.1	37.50 .05	39.7 1.2	31.77 .36	32.1 2.0	43.36 .06	13.7 0.8	37.22 .07	35.6 0.7
	30.1	37.46 −.03	38.5 1.2	31.45 .29	29.9 2.4	43.31 .04	12.9 0.8	37.16 .05	34.9 0.7
Feb.	9.1	37.44 .00	37.3 1.2	31.20 .21	27.3 2.7	43.27 −.02	12.2 0.7	37.12 −.03	34.2 0.6
	19.1	37.46 +.03	36.1 1.1	31.03 .12	24.5 2.9	43.27 +.01	11.6 0.5	37.10 .00	33.7 0.5
Mar.	1.0	37.50 .06	35.1 0.9	30.96 −.02	21.5 3.0	43.29 .04	11.2 0.4	37.12 +.03	33.3 0.3
	11.0	37.58 .10	34.4 0.7	31.00 +.09	18.5 2.9	43.35 .07	10.9 −0.1	37.16 .06	33.1 −0.1
	21.0	37.69 .14	33.8 0.4	31.14 .19	15.7 2.7	43.44 .11	10.9 +0.1	37.24 .10	33.1 +0.1
	30.9	37.85 .17	33.6 −0.1	31.38 .30	13.1 2.4	43.57 .15	11.1 0.4	37.36 .14	33.4 0.4
Apr.	9.9	38.04 .21	33.7 +0.3	31.72 .39	10.8 2.0	43.73 .19	11.7 0.7	37.51 .18	33.9 0.7
	19.9	38.26 .25	34.1 0.6	32.16 .47	9.0 1.6	43.93 .22	12.5 1.0	37.71 .21	34.8 1.0
	29.9	38.52 .27	34.9 1.0	32.67 .54	7.7 1.1	44.17 .25	13.6 1.3	37.94 .25	35.9 1.3
May	9.8	38.80 .30	36.0 1.3	33.24 .60	6.9 −0.5	44.44 .28	15.0 1.5	38.20 .28	37.3 1.5
	19.8	39.11 .32	37.5 1.6	33.86 .63	6.7 +0.1	44.73 .30	16.7 1.7	38.49 .30	38.9 1.7
	29.8	39.43 .33	39.2 1.9	34.51 .65	7.1 0.7	45.04 .32	18.5 1.9	38.79 .31	40.8 1.9
June	8.8	39.76 .33	41.2 2.1	35.15 .65	8.0 1.2	45.36 .32	20.5 2.1	39.11 .32	42.7 2.0
	18.7	40.09 .32	43.4 2.2	35.80 .63	9.5 1.8	45.69 .32	22.6 2.2	39.44 .33	44.8 2.1
	28.7	40.40 .31	45.7 2.3	36.41 .60	11.5 2.2	46.01 .31	24.8 2.2	39.76 .32	47.0 2.1
July	8.7	40.70 .29	48.0 2.4	36.99 .55	14.0 2.7	46.31 .30	26.9 2.1	40.07 .30	49.1 2.1
	18.6	40.97 .26	50.4 2.4	37.51 .49	16.8 3.0	46.60 .27	29.0 2.1	40.36 .28	51.2 2.0
	28.6	41.22 .22	52.7 2.3	37.96 .42	20.0 3.3	46.85 .24	31.0 1.9	40.63 .25	53.1 1.9
Aug.	7.6	41.42 .19	55.0 2.2	38.34 .34	23.4 3.5	47.07 .21	32.9 1.8	40.86 .22	55.0 1.7
	17.6	41.59 .15	57.1 2.0	38.63 .25	27.0 3.7	47.26 .17	34.5 1.6	41.06 .18	56.6 1.5
	27.5	41.71 .10	59.0 1.8	38.84 .16	30.8 3.7	47.41 .13	36.0 1.4	41.22 .14	58.0 1.3
Sept.	6.5	41.79 .06	60.8 1.6	38.95 +.07	34.5 3.7	47.52 .09	37.3 1.1	41.34 .10	59.2 1.1
	16.5	41.84 +.02	62.3 1.4	38.98 −.01	38.2 3.7	47.58 .05	38.3 0.9	41.42 .06	60.2 0.9
	26.5	41.84 −.02	63.6 1.2	38.93 .10	41.8 3.5	47.61 +.01	39.1 0.7	41.46 +.02	60.9 0.6
Oct.	6.4	41.81 .04	64.6 0.9	38.79 .18	45.2 3.3	47.61 −.02	39.7 0.5	41.47 −.01	61.4 0.4
	16.4	41.75 .07	65.4 0.7	38.58 .25	48.4 3.0	47.57 .05	40.0 0.2	41.44 .04	61.7 +0.2
	26.4	41.67 .09	66.0 0.4	38.30 .31	51.2 2.6	47.51 .07	40.1 +0.1	41.40 .06	61.8 0.0
Nov.	5.3	41.57 .10	66.2 +0.2	37.96 .37	53.5 2.2	47.43 .09	40.1 −0.1	41.33 .08	61.7 −0.2
	15.3	41.46 .11	66.3 −0.1	37.57 .41	55.5 1.7	47.34 .10	39.9 0.3	41.24 .09	61.5 0.3
	25.3	41.35 .12	66.1 0.3	37.14 .44	56.9 1.1	47.24 .10	39.5 0.4	41.15 .10	61.1 0.5
Dec.	5.3	41.23 .11	65.6 0.5	36.69 .46	57.7 +0.6	47.14 .11	39.0 0.6	41.05 .10	60.6 0.6
	15.2	41.12 .11	65.0 0.7	36.22 .47	58.0 0.0	47.03 .10	38.4 0.7	40.95 .10	60.0 0.7
	25.2	41.02 .10	64.2 0.9	35.76 .46	57.7 −0.6	46.93 .10	37.7 0.7	40.85 .10	59.3 0.7
	35.2	40.93 −.07	63.2 −1.2	35.31 −.44	56.8 −1.1	46.84 −.09	36.9 −0.8	40.75 −.10	58.5 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*γ Cephei.		*Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 34	+76° 56′	h m 23 48	+73° 43′	h m 23 52	+6° 10′
	s	″	s	″	s	″
Jan. 0.2	14.83 −.86	65.2 −0.5	49.39 −.67	52.6 −0.4	59.74 −.10	59.7 −0.7
10.2	13.99 .81	64.3 1.2	48.73 .64	51.9 1.0	59.64 .09	59.0 0.8
20.2	13.22 .73	62.9 1.7	48.11 .59	50.6 1.6	59.55 .08	58.2 0.8
30.1	12.54 .63	60.9 2.2	47.56 .51	48.8 2.1	59.48 .07	57.5 0.7
Feb. 9.1	11.98 .49	58.5 2.6	47.09 .42	46.5 2.5	59.43 .05	56.8 0.6
19.1	11.56 .34	55.8 2.9	46.73 .30	43.9 2.8	59.39 −.02	56.2 0.5
Mar. 1.0	11.31 −.16	52.8 3.0	46.50 .16	41.0 3.0	59.39 +.01	55.8 0.4
11.0	11.23 +.02	49.8 3.1	46.41 −.02	38.0 3.0	59.41 .04	55.6 −0.2
21.0	11.34 .20	46.8 3.0	46.46 +.13	35.0 2.9	59.47 .08	55.5 +0.1
31.0	11.62 .38	43.9 2.8	46.66 .27	32.2 2.8	59.57 .12	55.7 0.3
Apr. 9.9	12.08 .54	41.3 2.4	47.01 .41	29.6 2.5	59.71 .16	56.2 0.6
19.9	12.70 .69	39.1 2.0	47.48 .54	27.3 2.1	59.88 .20	57.0 0.9
29.9	13.46 .82	37.3 1.5	48.07 .65	25.5 1.6	60.10 .23	58.0 1.2
May 9.9	14.33 .92	36.0 1.0	48.77 .74	24.1 1.1	60.35 .26	59.3 1.5
19.8	15.28 .99	35.3 −0.4	49.54 .80	23.3 −0.5	60.62 .29	60.9 1.7
29.8	16.29 1.03	35.2 +0.2	50.37 .85	23.1 +0.1	60.92 .31	62.7 1.9
June 8.8	17.33 1.04	35.7 0.7	51.23 .87	23.4 0.6	61.24 .32	64.6 2.0
18.7	18.36 1.02	36.7 1.3	52.09 .86	24.4 1.2	61.57 .33	66.7 2.1
28.7	19.37 .98	38.3 1.8	52.94 .83	25.8 1.7	61.89 .32	68.8 2.1
July 8.7	20.31 .91	40.3 2.3	53.75 .78	27.8 2.2	62.21 .31	70.9 2.1
18.7	21.18 .82	42.9 2.7	54.50 .72	30.2 2.6	62.51 .29	73.0 2.1
28.6	21.94 .71	45.8 3.1	55.18 .64	33.0 3.0	62.78 .26	75.0 2.0
Aug. 7.6	22.59 .59	49.0 3.4	55.77 .54	36.1 3.3	63.03 .23	76.9 1.8
17.6	23.12 .46	52.6 3.6	56.26 .44	39.5 3.5	63.24 .19	78.6 1.6
27.6	23.50 .32	56.3 3.8	56.64 .33	43.2 3.7	63.42 .16	80.1 1.4
Sept. 6.5	23.75 .18	60.1 3.8	56.91 .21	46.9 3.8	63.56 .12	81.4 1.2
16.5	23.85 +.03	63.9 3.8	57.07 +.10	50.7 3.8	63.66 .08	82.4 0.9
26.5	23.81 −.11	67.7 3.8	57.11 −.02	54.5 3.7	63.72 .04	83.3 0.7
Oct. 6.4	23.63 .25	71.4 3.6	57.03 .13	58.2 3.6	63.74 +.01	83.9 0.5
16.4	23.32 .38	74.9 3.4	56.85 .24	61.6 3.4	63.74 −.02	84.2 0.3
26.4	22.87 .50	78.1 3.0	56.56 .34	64.9 3.1	63.71 .04	84.4 +0.1
Nov. 5.4	22.32 .61	81.0 2.7	56.17 .43	67.8 2.7	63.66 .06	84.4 −0.1
15.3	21.66 .71	83.4 2.2	55.70 .51	70.2 2.3	63.58 .08	84.2 0.3
25.3	20.91 .78	85.4 1.7	55.16 .58	72.3 1.8	63.50 .09	83.9 0.4
Dec. 5.3	20.10 .83	86.7 1.1	54.55 .63	73.7 1.2	63.40 .10	83.4 0.5
15.3	19.25 .86	87.5 +0.5	53.91 .66	74.6 +0.6	63.30 .10	82.8 0.6
25.2	18.39 .86	87.7 −0.2	53.25 .67	74.9 0.0	63.20 .10	82.2 0.7
35.2	17.53 −.84	87.2 −0.8	52.58 −.66	74.6 −0.7	63.10 −.10	81.4 −0.7

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
1877.	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 0	18 45 29.73	30.37	−23 2 42.9	42.3	11.040	+11.99	+ 3 38.06	16 18.46	1 11.13	18 41 51.73
1	18 49 54.54	55.26	22 57 41.2	40.4	11.027	13.14	4 6.32	18.46	11.09	18 45 48.29
2	18 54 19.02	19.83	22 52 12.1	11.1	11.013	14.27	4 34.25	18.45	11.03	18 49 44.85
3	18 58 43.14	44.04	22 46 15.7	14.5	10.997	15.41	5 1.82	18.44	10.97	18 53 41.41
4	19 3 6.87	7.85	22 39 52.2	50.8	10.980	16.54	5 28.98	18.41	10.90	18 57 37.97
5	19 7 30.19	31.25	22 33 1.8	0.2	10.962	17.65	5 55.75	18.38	10.84	19 1 34.53
6	19 11 53.06	54.20	22 25 44.6	42.7	10.944	18.76	6 22.09	18.35	10.78	19 5 31.08
7	19 16 15.47	16.69	22 17 60.8	58.7	10.924	19.86	6 47.94	18.31	10.71	19 9 27.64
8	19 20 37.38	38.67	22 9 50.6	48.3	10.902	20.96	7 13.30	18.27	10.64	19 13 24.20
9	19 24 58.77	60.14	22 1 14.3	11.6	10.879	22.04	7 38.14	18.22	10.57	19 17 20.76
10	19 29 19.60	21.03	21 52 12.2	9.1	10.856	23.11	8 2.41	18.17	10.48	19 21 17.32
11	19 33 39.86	41.36	21 42 44.5	41.1	10.832	24.17	8 26.11	18.12	10.40	19 25 13.88
12	19 37 59.53	61.09	21 32 51.4	47.8	10.806	25.22	8 49.23	18.06	10.32	19 29 10.44
13	19 42 18.57	20.20	21 22 33.1	29.4	10.779	26.26	9 11.72	18.00	10.24	19 33 7.00
14	19 46 36.96	38.65	21 11 50.5	46.2	10.752	27.28	9 33.56	17.93	10.15	19 37 3.55
15	19 50 54.68	56.43	21 0 43.3	38.7	10.723	28.30	9 54.72	17.86	10.06	19 41 0.11
16	19 55 11.70	13.51	20 49 12.0	7.1	10.694	29.30	10 15.18	17.78	9.96	19 44 56.66
17	19 59 28.01	29.87	20 37 17.0	11.7	10.664	30.28	10 34.93	17.70	9.86	19 48 53.22
18	20 3 43.58	45.49	20 24 58.5	52.9	10.633	31.24	10 53.93	17.62	9.76	19 52 49.78
19	20 7 58.40	60.36	20 12 17.0	11.1	10.601	32.19	11 12.25	17.53	9.66	19 56 46.34
20	20 12 12.45	14.46	19 59 12.8	6.5	10.569	33.13	11 29.70	17.44	9.55	20 0 42.90
21	20 16 25.71	27.76	19 45 46.4	39.8	10.536	34.05	11 46.39	17.34	9.44	20 4 39.46
22	20 20 38.18	40.27	19 31 58.0	51.1	10.503	34.96	12 2.30	17.24	9.33	20 8 36.02
23	20 24 49.85	51.98	19 17 48.0	40.8	10.469	35.86	12 17.41	17.14	9.22	20 12 32.58
24	20 29 0.70	2.87	19 3 16.8	9.3	10.435	36.73	12 31.70	17.02	9.11	20 16 29.13
25	20 33 10.74	12.94	18 48 24.8	16.9	10.401	37.59	12 45.18	16.90	9.00	20 20 25.69
26	20 37 19.96	22.19	18 33 12.4	4.2	10.367	38.43	12 57.83	16.78	8.88	20 24 22.25
27	20 41 28.36	30.62	18 17 40.0	31.5	10.333	39.25	13 9.67	16.66	8.77	20 28 18.81
28	20 45 35.94	38.22	18 1 47.9	39.1	10.298	40.07	13 20.70	16.53	8.65	20 32 15.36
29	20 49 42.69	44.99	17 45 36.4	27.3	10.264	40.87	13 30.89	16.39	8.54	20 36 11.92
30	20 53 48.62	50.94	17 28 65.9	56.5	10.230	41.65	13 40.25	16.25	8.42	20 40 8.47
31	20 57 53.74	56.08	17 12 16.9	7.2	10.197	42.42	13 48.81	16.11	8.31	20 44 5.03
Feb. 1	21 1 58.05	60.41	16 54 69.7	59.8	10.164	43.17	13 56.55	15.96	8.20	20 48 1.59
2	21 6 1.55	3.92	16 37 44.7	34.5	10.130	43.90	14 3.49	15.80	8.08	20 51 58.15
3	21 10 4.25	6.63	16 19 62.3	51.9	10.096	44.62	14 9.63	15.63	7.97	20 55 54.70
4	21 14 6.15	8.53	16 1 62.9	52.2	10.062	45.32	14 14.95	15.46	7.86	20 59 51.26
5	21 18 7.24	9.63	15 43 46.9	36.1	10.029	46.00	14 19.47	15.29	7.75	21 3 47.81
6	21 22 7.55	9.94	15 25 14.7	3.6	9.996	46.67	14 23.22	15.11	7.63	21 7 44.37
7	21 26 7.07	9.46	15 6 26.6	15.3	9.964	47.31	14 26.18	14.93	7.52	21 11 40.92
8	21 30 5.82	8.21	14 47 23.2	11.8	9.931	47.95	14 28.35	14.75	7.41	21 15 37.48
9	21 34 3.78	6.17	14 27 64.7	53.1	9.899	48.57	14 29.75	14.56	7.30	21 19 34.04
10	21 38 0.97	3.36	14 8 31.7	19.9	9.867	49.16	14 30.38	14.37	7.19	21 23 30.60
11	21 41 57,39	59.77	13 48 44.6	32.7	9.835	49.74	14 30.24	14.17	7.08	21 27 27.15
12	21 45 53.05	55.42	13 28 43.9	31.9	9.803	50.30	14 29.34	13.98	6.96	21 31 23.71
13	21 49 47.96	50.32	13 8 29.9	17.7	9.772	50.84	14 27.68	13.78	6.85	21 35 20.26
14	21 53 42.13	44.48	12 47 63.1	50.9	9.741	51.37	14 25.29	13.58	6.74	21 39 16.82
15	21 57 35.56	37.89	12 27 24.0	11.7	9.711	51.87	14 22.16	13.38	6.64	21 43 13.37
16	22 1 28.26	30.57	12 6 33.0	20.6	9.681	52.36	14 18.30	13.17	6.53	21 47 9.93
17	22 5 20.24	22.53	11 45 30.6	18.1	9.651	52.83	14 13.72	12.97	6.43	21 51 6.48
18	22 9 11.51	13.78	11 24 17.2	4.7	9.621	53.27	14 8.45	12.76	6.33	21 55 3.04
19	22 13 2.08	4.33	11 2 53.1	40.6	9.592	53.71	14 2.44	12.55	6.24	21 58 59.59
20	22 16 51.97	54.20	10 41 18.9	6.4	9.564	54.13	13 55.76	12.33	6.14	22 2 56.15
21	22 20 41.19	43.40	10 19 35.0	22.5	9.537	54.52	13 48.42	12.11	6.05	22 6 52.70
22	22 24 29.76	31.94	9 57 41.8	29.3	9.510	54.90	13 40.43	11.89	5.96	22 10 49.25
23	22 28 17.69	19.83	9 35 39.6	27.2	9.485	55.26	13 31.80	11.67	5.87	22 14 45.81
24	22 32 5.01	7.12	9 13 28.8	16.5	9.460	55.61	13 22.56	11.44	5.78	22 18 42.36
25	22 35 51.72	53.80	8 50 69.8	57.5	9.435	55.95	13 12.73	11.21	5.70	22 22 38.91
26	22 39 37.86	39.91	8 28 43.1	30.8	9.411	56.26	13 2.31	11.98	5.61	22 26 35.47
27	22 43 23.44	25.46	8 5 68.9	56.7	9.388	56.56	12 51.33	11.74	5.53	22 30 32.02
28	22 47 8.49	10.47	7 43 27.8	15.7	9.367	56.85	12 39.82	11.50	5.46	22 34 28.58
29	22 50 53.03	54.97	− 7 20 39.9	28.0	9.346	+57.13	+12 27.80	16 10.25	1 5.39	22 38 25.13

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.19 from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon,	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
1877.	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Mar. 1	22 50 53.03	54.97	− 7 20 39.9	28.0	9.346	+57.13	+12 27.80	16 10.25	1 5.39	22 38 25.13
2	22 54 37.08	38.99	6 57 45.8	34.0	9.326	57.38	12 15.30	10.00	5.32	22 42 21.69
3	22 58 20.65	22.53	6 34 45.6	34.0	9.307	57.62	12 2.32	9.75	5.25	22 46 18.24
4	23 2 3.78	5.62	6 11 39.9	28.4	9.289	57.84	11 48.88	9.49	5.18	22 50 14.80
5	23 5 46.48	48.28	5 48 29.0	17.7	9.271	58.05	11 35.02	9.23	5.12	22 54 11.35
6	23 9 28.77	30.53	5 25 13.3	2.2	9.255	58.25	11 20.76	8.97	5.06	22 58 7.91
7	23 13 10.67	12.39	5 1 53.1	42.2	9.239	58.42	11 6.10	8.71	5.00	23 2 4.46
8	23 16 52.21	53.89	4 38 28.8	18.1	9.224	58.58	10 51.09	8.45	4.94	23 6 1.01
9	23 20 33.40	35.04	4 14 60.8	50.4	9.209	58.73	10 35.73	8.18	4.89	23 9 57.56
10	23 24 14.27	15.86	3 51 29.5	19.3	9.196	58.87	10 20.04	7.91	4.84	23 13 54.12
11	23 27 54.82	56.37	3 27 55.2	45.2	9.183	58.98	10 4.05	7.64	4.79	23 17 50.67
12	23 31 35.08	36.59	3 4 18.5	8.8	9.172	59.07	9 47.75	7.37	4.75	23 21 47.23
13	23 35 15.05	16.52	2 40 39.7	30.3	9.161	59.14	9 31.17	7.10	4.71	23 25 43.78
14	23 38 54.77	56.19	2 16 59.3	50.2	9.151	59.21	9 14.33	6.83	4.67	23 29 40.34
15	23 42 34.25	35.63	1 53 17.5	8.7	9.141	59.26	8 57.27	6.56	4.63	23 33 36.89
16	23 46 13.51	14.84	1 29 34.8	26.3	9.132	59.28	8 39.97	6.29	4.60	23 37 33.44
17	23 49 52.55	53.83	1 5 51.6	43.4	9.123	59.30	8 22.46	6.02	4.57	23 41 29.99
18	23 53 31.40	32.63	0 42 8.3	0.3	9.115	59.30	8 4.76	5.75	4.55	23 45 26.55
19	23 57 10.07	11.25	− 0 18 25.2	17.5	9.108	59.28	7 46.88	5.48	4.53	23 49 23.10
20	0 0 48.59	49.73	+ 0 5 17.1	24.5	9.102	59.27	7 28.84	5.21	4.51	23 53 19.66
21	0 4 26.98	28.08	0 28 58.4	65.5	9.097	59.20	7 10.69	4.94	4.50	23 57 16.21
22	0 8 5.25	6.30	0 52 38.2	45.0	9.092	59.13	6 52.42	4.67	4.48	0 1 12.76
23	0 11 43.42	44.43	1 16 16.4	22.9	9.088	59.05	6 34.04	4.40	4.47	0 5 9.31
24	0 15 21.52	22.48	1 39 52.5	58.7	9.086	58.96	6 15.58	4.13	4.46	0 9 5.87
25	0 18 59.56	60.47	2 3 26.1	32.0	9.084	58.84	5 57.07	3.86	4.46	0 13 2.42
26	0 22 37.57	38.43	2 26 57.0	62.5	9.083	58.72	5 38.53	3.59	4.46	0 16 58.98
27	0 26 15.57	16.38	2 50 24.8	30.0	9.083	58.59	5 19.98	3.31	4.46	0 20 55.53
28	0 29 53.60	54.37	3 13 49.1	54.0	9.085	58.44	5 1.44	3.04	4.46	0 24 52.09
29	0 33 31.66	32.39	3 37 9.8	14.3	9.088	58.27	4 42.96	2.76	4.47	0 28 48.64
30	0 37 9.79	10.47	4 0 26.3	30.6	9.091	58.10	4 24.55	2.48	4.48	0 32 45.19
31	0 40 48.00	48.63	4 23 38.6	42.6	9.095	57.91	4 6.21	2.20	4.50	0 36 41.74
Apr. 1	0 44 26.31	26.90	4 46 46.1	49.8	9.100	57.71	3 47.98	1.92	4.51	0 40 38.30
2	0 48 4.76	5.31	5 9 48.6	52.0	9.105	57.49	3 29.88	1.64	4.53	0 44 34.85
3	0 51 43.36	43.86	5 32 45.7	48.8	9.112	57.26	3 11.92	1.36	4.55	0 48 31.41
4	0 55 22.13	22.59	5 55 37.2	40.0	9.120	57.01	2 54.14	1.08	4.58	0 52 27.96
5	0 59 1.09	1.50	6 18 22.6	25.1	9.128	56.75	2 36.54	0.80	4.61	0 56 24.52
6	1 2 40.26	40.62	6 41 1.7	3.9	9.137	56.48	2 19.16	0.51	4.64	1 0 21.07
7	1 6 19.66	19.98	7 3 34.1	36.0	9.147	56.20	2 2.02	16 0.23	4.67	1 4 17.62
8	1 9 59.31	59.58	7 25 59.4	61.0	9.157	55.89	1 45.12	15 59.95	4.70	1 8 14.17
9	1 13 39.22	39.45	7 48 17.3	18.7	9.168	55.58	1 28.49	59.67	4.74	1 12 10.73
10	1 17 19.41	19.60	8 10 27.4	28.6	9.180	55.25	1 12.13	59.40	4.78	1 16 7.28
11	1 20 59.89	60.04	8 32 29.3	30.3	9.193	54.90	0 56.05	59.12	4.82	1 20 3.84
12	1 24 40.68	40.79	8 54 22.7	23.4	9.206	54.54	0 40.28	58.85	4.87	1 24 0.39
13	1 28 21.78	21.85	9 16 7.2	7.7	9.219	54.17	0 24.83	58.58	4.92	1 37 56.95
14	1 32 3.21	3.24	9 37 42.5	42.8	9.233	53.77	+ 0 9.71	58.31	4.97	1 31 53.50
15	1 35 44.98	44.97	9 59 8.2	8.3	9.247	53.36	− 0 5.08	58.04	5.02	1 35 50.06
16	1 39 27.10	27.06	10 20 23.9	23.7	9.262	52.94	0 19.51	57.78	5.08	1 39 46.61
17	1 43 9.59	9.51	10 41 29.3	28.9	9.278	52.50	0 33.56	57.52	5.13	1 43 43.17
18	1 46 52.46	52.34	11 2 24.0	23.4	9.294	52.05	0 47.24	57.26	5.19	1 47 39.72
19	1 50 35.72	35.56	11 23 7.7	6.9	9.310	51.59	1 0.54	57.01	5.25	1 51 36.28
20	1 54 19.38	19.19	11 43 40.0	39.0	9.327	51.11	1 13.44	56.76	5.31	1 55 32.83
21	1 58 3.45	3.23	12 3 60.7	59.5	9.345	50.61	1 25.92	56.51	5.37	1 59 29.39
22	2 1 47.95	47.69	12 24 9.4	8.1	9.363	50.10	1 37.97	56.26	5.44	2 3 25.94
23	2 5 32.89	32.60	12 44 5.7	4.2	9.382	49.59	1 49.58	56.01	5.51	2 7 22.50
24	2 9 18.29	17.97	13 3 49.6	47.9	9.401	49.05	2 0.74	55.76	5.58	2 11 19.05
25	2 13 4.15	3.80	13 23 20.6	18.8	9.421	48.51	2 11.43	55.51	5.65	2 15 15.61
26	2 16 50.50	50.12	13 42 38.3	36.4	9.441	47.96	2 21.64	55.27	5.72	2 19 12.16
27	2 20 37.34	36.94	14 1 42.5	40.5	9.462	47.40	2 31.35	55.02	5.80	2 23 8.72
28	2 24 24.69	24.27	14 20 32.9	30.8	9.484	46.82	2 40.55	54.78	5.87	2 27 5.27
29	2 28 12.56	12.12	14 39 9.3	7.1	9.506	46.22	2 49.25	54.54	5.95	2 31 1.83
30	2 32 0.96	0.50	14 57 31.4	29.1	9.528	45.61	2 57.41	54.30	6.03	2 34 58.38
31	2 35 49.90	49.42	+15 15 38.7	36.4	9.551	+44.99	− 3 5.02	15 54.06	1 6.11	2 38 54.94

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date. 1877.	APPARENT RIGHT ASCENSION. Mean Noon.	APPARENT RIGHT ASCENSION. Apparent Noon.	APPARENT DECLINATION. Mean Noon.	APPARENT DECLINATION. Apparent Noon.	Hourly Motion. Mean Noon. Right Ascension.	Hourly Motion. Mean Noon. Declination.	Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 1	2 35 49.90	49.42	+15 15 38.7	36.4	9.551	+44.99	−3 5.02	15 54.06	1 6.11	2 38 54.94
2	2 39 39.40	38.90	15 33 31.0	28.6	9.574	44.36	3 12.06	53.82	6.19	2 42 51.49
3	2 43 29.46	28.94	15 51 8.0	5.5	9.597	43.71	3 18.55	53.58	6.27	2 46 48.05
4	2 47 20.10	19.56	16 8 29.3	26.8	9.621	43.06	3 24.48	53.35	6.35	2 50 44.61
5	2 51 11.31	10.75	16 25 34.7	32.2	9.645	42.38	3 29.83	53.12	6.43	2 54 41.17
6	2 55 3.11	2.53	16 42 23.9	21.4	9.670	41.70	3 34.59	52.89	6.51	2 58 37.72
7	2 58 55.50	54.91	16 58 56.5	54.0	9.694	41.01	3 38.76	52.66	6.59	3 2 34.28
8	3 2 48.47	47.87	17 15 12.3	9.8	9.719	40.30	3 42.35	52.44	6.67	3 6 30.83
9	3 6 42.03	41.42	17 31 10.9	8.4	9.743	39.57	3 45.35	52.23	6.75	3 10 27.39
10	3 10 36.18	35.56	17 46 52.1	49.5	9.768	38.84	3 47.76	52.02	6.83	3 14 23.95
11	3 14 30.91	30.29	18 2 15.3	12.8	9.792	38.09	3 49.58	51.81	6.91	3 18 20.51
12	3 18 26.22	25.59	18 17 20.4	17.9	9.817	37.33	3 50.82	51.60	7.00	3 22 17.06
13	3 22 22.11	21.47	18 32 6.9	4.5	9.841	36.55	3 51.50	51.40	7.08	3 26 13.62
14	3 26 18.56	17.92	18 46 34.7	32.4	9.864	35.76	3 51.61	51.20	7.16	3 30 10.17
15	3 30 15.58	14.94	19 0 43.5	41.2	9.888	34.97	3 51.15	51.00	7.24	3 34 6.73
16	3 34 13.16	12.52	19 14 33.0	30.8	9.911	24.15	3 50.12	50.81	7.32	3 38 3.29
17	3 38 11.29	10.65	19 28 3.0	0.9	9.934	33.32	3 48.54	50.62	7.40	3 41 59.85
18	3 42 9.97	9.35	19 41 13.0	11.0	9.956	32.49	3 46.43	50.44	7.48	3 45 56.40
19	3 46 9.18	8.55	19 54 2.8	0.8	9.978	31.65	3 43.79	50.26	7.56	3 49 52.96
20	3 50* 8.91	8.29	20 6 32.2	30.2	10.000	30.80	3 40.62	50.09	7.64	3 53 49.52
21	3 54 9.17	8.55	20 18 41.0	39.1	10.021	29.93	3 36.92	49.92	7.72	3 57 46.08
22	3 58 9.93	9.33	20 30 29.0	27.2	10.042	29.06	3 32.70	49.75	7.80	4 1 42.63
23	4 2 11.20	10.61	20 41 56.0	54.3	10.063	28.18	3 27.99	49.59	7.87	4 5 39.19
24	4 6 12.98	12.40	20 53 1.6	0.0	10.084	27.29	3 22.78	49.43	7.94	4 9 35.75
25	4 10 15.25	14.68	21 3 45.8	44.3	10.105	26.39	3 17.07	49.27	8.01	4 13 32.31
26	4 14 18.00	17.45	21 14 8.1	6.7	10.125	25.47	3 10.88	49.11	8.08	4 17 28.86
27	4 18 21.22	20.69	21 24 8.5	7.2	10.145	24.55	3 4.22	48.96	8.15	4 21 25.42
28	4 22 24.91	24.40	21 33 46.9	45.7	10.164	23.63	2 57.09	48.81	8.21	4 25 21.98
29	4 26 29.07	28.58	21 43 2.9	1.8	10.183	22.70	2 49.48	48.66	8.27	4 29 18.54
30	4 30 33.68	33.21	21 51 56.5	55.5	10.201	21.76	2 41.43	48.51	8.33	4 33 15.09
31	4 34 38.72	38.27	22 0 27.3	26.4	10.219	20.80	2 32.95	48.37	8.39	4 37 11.65
June 1	4 38 44.18	43.76	22 8 35.3	34.4	10.236	19.84	2 24.04	48.23	8.44	4 41 8.21
2	4 42 50.05	49.66	22 16 20.1	19.3	10.252	18.87	2 14.73	48.09	8.49	4 45 4.77
3	4 46 56.33	55.97	22 23 41.7	41.0	10.268	17.90	2 5.01	47.96	8.54	4 49 1.32
4	4 51 2.98	2.65	22 30 39.9	39.3	10.283	16.92	1 54.91	47.83	8.59	4 52 57.88
5	4 55 9.99	9.68	22 37 14.5	14.0	10.298	15.93	1 44.46	47.71	8.64	4 56 54.44
6	4 59 17.34	17.06	22 43 25.4	25.0	10.312	14.94	1 33.67	47.60	8.69	5 0 51.00
7	5 3 25.01	24.76	22 49 12.4	12.0	10.326	13.95	1 22.56	47.49	8.73	5 4 47.56
8	5 7 32.98	32.77	22 54 35.3	35.0	10.337	12.95	1 11.15	47.38	8.77	5 8 44.12
9	5 11 41.21	41.03	22 59 34.1	33.9	10.348	11.95	0 59.47	47.27	8.81	5 12 40.67
10	5 15 49.69	49.54	23 4 8.6	8.5	10.358	10.94	0 47.53	47.17	8.84	5 16 37.24
11	5 19 58.39	58.27	23 8 18.7	18.6	10.366	9.92	0 35.39	47.07	8.87	5 20 33.79
12	5 24 7.29	7.21	23 12 4.3	4.2	10.373	8.90	0 23.06	46.98	8.89	5 24 30.35
13	5 28 16.35	16.31	23 15 25.4	25.3	10.380	7.87	−0 10.56	46.89	8.91	5 28 26.91
14	5 32 25.56	25.55	23 18 21.8	21.8	10.386	6.84	+0 2.09	46.82	8.93	5 32 23.47
15	5 36 34.89	34.92	23 20 53.6	53.6	10.390	5.81	0 14.86	46.75	8.94	5 36 20.03
16	5 40 44.31	44.38	23 23 0.7	0.7	10.393	4.78	0 27.73	46.68	8.95	5 40 16.59
17	5 44 53.79	53.89	23 24 43.0	43.0	10.395	3.75	0 40.66	46.61	8.96	5 44 13.15
18	5 49 3.31	3.45	23 26 0.6	0.6	10.396	2.72	0 53.62	46.55	8.97	5 48 9.71
19	5 53 12.84	13.01	23 26 53.3	53.3	10.396	1.68	1 6.59	46.50	8.97	5 52 6.27
20	5 57 22.36	22.57	23 27 21.3	21.3	10.396	+ 0.65	1 19.55	46.45	8.97	5 56 2.83
21	6 1 31.86	32.11	23 27 24.4	24.4	10.394	− 0.38	1 32.49	46.40	8.97	5 59 59.38
22	6 5 41.31	41.60	23 27 2.8	2.8	10.391	1.41	1 45.40	46.36	8.97	6 3 55.94
23	6 9 50.68	51.01	23 26 16.5	16.5	10.388	2.44	1 58.21	46.32	8.96	6 7 52.50
24	6 13 59.96	60.33	23 25 5.5	5.4	10.384	3.47	2 10.92	46.28	8.95	6 11 49.06
25	6 18 9.13	9.54	23 23 29.8	29.7	10.380	4.40	2 23.53	46.25	8.94	6 15 45.62
26	6 22 18.17	18.61	23 21 29.5	29.3	10.374	5.52	2 36.01	46.22	8.92	6 19 42.18
27	6 26 27.06	27.53	23 19 4.6	4.3	10.367	6.54	2 48.34	46.20	8.89	6 23 38.74
28	6 30 35.78	36.29	23 16 15.2	14.8	10.359	7.56	3 0.52	46.18	8.86	6 27 35.30
29	6 34 44.32	44.87	23 13 1.3	0.9	10.351	8.58	3 12.51	46.16	8.83	6 31 31.85
30	6 38 52.65	53.23	23 9 23.0	22.5	10.342	9.60	3 24.28	46.14	8.80	6 35 28.41
31	6 43 0.76	1.37	+23 5 20.4	19.8	10 332	−10.61	+3 35.82	15 46.13	1 8.76	6 39 24.97

NOTE.- For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon,	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
877.	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
uly 1	6 43 0.76	1.37	+23 5 20.4	19.8	10.332	-10.61	+3 35.82	15 46.13	1 8.76	6 39 24.97
2	6 47 8.62	9.36	23 0 53.6	52.9	10.321	11.62	3 47.12	46.12	8.72	6 43 21.53
3	6 51 16.22	16.89	22 56 2.7	1.9	10.309	12.62	3 58.15	46.12	8.68	6 47 18.09
4	6 55 23.52	24.22	22 50 47.8	46.9	10.297	13.62	4 8.90	46.12	8.64	6 51 14.65
5	6 59 30.52	31.25	22 45 8.9	7.9	10.285	14.61	4 19.34	46.13	8.59	6 55 11.21
6	7 3 37.19	37.95	22 39 6.3	5.1	10.271	15.60	4 29.46	46.14	8.54	6 59 7.77
7	7 7 43.53	44.32	22 32 40.0	38.7	10.257	16.58	4 39.25	46.15	8.49	7 3 4.32
8	7 11 49.50	50.31	22 25 50.3	48.9	10.240	17.56	4 48.66	46.17	8.44	7 7 0.88
9	7 15 55.07	55.90	22 18 37.2	35.7	10.223	18.53	4 57.67	46.20	8.38	7 10 57.44
10	7 20 0.22	1.07	22 10 61.1	59.5	10.205	19.48	5 6.26	46.23	8.32	7 14 54.00
11	7 24 4.93	5.81	22 3 2.0	0.3	10.187	20.43	5 14.41	46.27	8.26	7 18 50.56
12	7 28 9.19	10.09	21 54 40.2	38.3	10.168	21.37	5 22.11	46.32	8.20	7 22 47.12
13	7 32 12.97	13.89	21 45 55.8	53.8	10.148	22.31	5 29.32	46.37	8.13	7 26 43.68
14	7 36 16.27	17.20	21 36 49.1	47.0	10.127	23.24	5 36.05	46.42	8.06	7 30 40.24
15	7 40 19.06	20.01	21 27 20.4	18.2	10.105	24.15	5 42.29	46.48	7.99	7 34 36.79
16	7 44 21.33	22.29	21 17 29.8	27.4	10.083	25.05	5 48.01	46.55	7.91	7 38 33.35
17	7 48 23.06	24.03	21 7 17.5	15.0	10.061	25.95	5 53.20	46.62	7.83	7 42 29.90
18	7 52 24.24	25.23	20 56 43.9	41.3	10.038	26.84	5 57.82	46.70	7.76	7 46 26.46
19	7 56 24.86	25.86	20 45 49.1	46.4	10.014	27.72	6 1.87	46.78	7.68	7 50 23.02
20	8 0 24.91	25.92	20 34 33.4	30.6	9.990	28.58	6 5.36	46.86	7.60	7 54 19.58
21	8 4 24.39	25.41	20 22 57.1	54.2	9.966	29.44	6 8.28	46.94	7.52	7 58 16.13
22	8 8 23.29	24.32	20 10 60.3	57.3	9.942	30.29	6 10.62	47.03	7.44	8 2 12.69
23	8 12 21.61	22.64	19 58 43.3	40.2	9.918	31.13	6 12.37	47.12	7.36	8 6 9.25
24	8 16 19.33	20.36	19 46 6.3	3.0	9.894	31.96	6 13.54	47.21	7 28	8 10 5.81
25	8 20 16.47	17.50	19 33 9.7	6.3	9.869	32.77	6 14 12	47.31	7.20	8 14 2.36
26	8 24 13.01	14.04	19 19 53.6	50.2	9.845	33.57	6 14.10	47.41	7.12	8 17 58.92
27	8 28 8.97	9.99	19 6 18.3	14.8	9.820	34.37	6 13.49	47.52	7.03	8 21 55.48
28	8 32 4.33	5.35	18 52 24.0	20.4	9.796	35.15	6 12.29	47.63	6.95	8 25 52.04
29	8 35 59.11	60.12	18 38 11.1	7.4	9.771	35.92	6 10.51	47.74	6 86	8 29 48.59
30	8 39 53.30	54.30	18 23 39.8	36.1	9.746	36.68	6 8.14	47.86	6.78	8 33 45.15
31	8 43 46.90	47.89	18 8 50.3	46.5	9.722	37.43	6 5.19	47.98	6.69	8 37 41.71
Aug. 1	8 47 39.92	40.90	17 53 42.9	39.1	9.697	38.17	6 1.64	48.10	6.61	8 41 38.27
2	8 51 32.35	33.32	17 38 17.8	14.0	9.673	38.89	5 57.51	48.23	6.52	8 45 34.82
3	8 55 24.19	25.15	17 22 35.4	31.5	9.648	39.61	5 52.79	48.36	6.43	8 49 31.38
4	8 59 15.45	16.39	17 6 35.9	32.0	9.624	40.32	5 47.50	48.49	6.34	8 53 27.93
5	9 3 6.13	7.05	16 50 19.7	15.8	9.599	41.02	5 41.62	48.63	6.25	8 57 24.49
6	9 6 56.22	57.13	16 33 46.9	43.0	9.575	41.69	5 35.14	48.77	6 17	9 1 21.05
7	9 10 45.73	46.61	16 16 58.2	54.3	9.551	42.36	5 28.10	48.92	6.08	9 5 17.61
8	9 14 34.66	35.52	15 59 53.6	49.8	9.527	43.01	5 20.48	49.07	5.99	9 9 14.16
9	9 18 23.01	23.84	15 42 33.6	29.8	9.503	43.65	5 12.28	49.23	5.90	9 13 10.72
10	9 22 10.78	11.59	15 24 58.4	54.6	9.479	44.27	5 3.50	49.40	5.82	9 17 7.27
11	9 25 57.98	58.76	15 7 8.5	4.8	9.455	44.88	4 54.15	49.57	5.74	9 21 3.83
12	9 29 44.61	45.36	14 49 4.0	0.4	9.431	45.47	4 44.22	49.74	5.66	9 25 0.38
13	9 33 30.68	31.40	14 30 45.4	41.9	9.408	46.06	4 33.72	49.92	5.58	9 28 56.94
14	9 37 16.19	16.88	14 12 13.0	9.6	9.385	46.63	4 22.66	50.10	5 50	9 32 53.50
15	9 41 1.17	1.81	13 53 27.2	23.8	9.362	47.19	4 11.06	50.28	5.42	9 36 50.06
16	9 44 45.57	46.20	13 34 28.1	24.8	9.339	47.72	3 58.93	50.47	5.35	9 40 46.61
17	9 48 29.46	30.06	13 15 16.3	13.1	9.318	48.25	3 46.27	50.66	5.28	9 44 43.16
18	9 52 12.82	13.38	12 55 51.9	48.9	9.297	48.77	3 33.08	50.85	5.21	9 48 39.72
19	9 55 55.68	56.20	12 36 15.4	12.6	9.276	49.27	3 19.38	51.05	5.14	9 52 36.28
20	9 59 38.04	38.53	12 16 26.9	24.3	9.256	49.76	3 5.19	51.25	5.07	9 56 32.83
21	10 3 19.93	20.38	11 56 26.9	24.4	9.236	50.24	2 50.53	51.45	5.00	10 0 29.39
22	10 7 1.36	1.77	11 36 15.5	13.2	9.217	50.71	2 35.40	51.66	4.94	10 4 25.94
23	10 10 42.34	42.71	11 15 53.1	51.0	9.198	51.15	2 19.82	51.87	4.87	10 8 22.50
24	10 14 22.89	23.22	10 55 20.1	18.2	9.180	51.59	2 3.82	52.08	4.81	10 12 19.05
25	10 18 3.03	3.32	10 34 36.7	35.0	9.164	52.02	1 47.40	52.29	4.75	10 16 15.61
26	10 21 42.77	43.02	10 13 43.1	41.6	9.148	52.44	1 30.59	52.50	4.69	10 20 12.16
27	10 25 22.15	22.35	9 52 39.7	38.4	9.133	52.84	1 13.41	52.72	4.63	10 24 8.72
28	10 29 1.16	1.32	9 31 26.7	25.7	9.119	53.23	0 55.88	52.94	4.58	10 28 5.27
29	10 32 39.84	39.95	9 10 4.6	3.9	9.105	53.60	0 38.01	53.15	4.53	10 32 1.82
30	10 36 18.20	18.27	8 48 33.4	32.9	9.091	53.97	0 19.83	53.37	4.48	10 35 58.37
31	10 39 56.25	56.27	+ 8 26 53.7	53.5	9.078	-54.33	+0 1.33	15 53.59	1 4.43	10 39 54.93

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
1877.	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Sept. 1	10 43 34.00	33.98	+ 8 5 5.6	5.7	9.067	−54.67	− 0 17.47	15 53.82	1 4.39	10 43 51.48
2	10 47 11.49	11.42	7 43 9.6	10.0	9.056	55.00	0 36.54	54.05	4.34	10 47 48.04
3	10 50 48.73	48.61	7 21 6.0	6.8	9.046	55.30	0 55.85	54.28	4.30	10 51 44.59
4	10 54 25.73	25.56	6 58 55.2	56.3	9.037	55.60	1 15.39	54.51	4.26	10 55 41.15
5	10 58 2.51	2.29	6 36 37.3	38.7	9.028	55.88	1 35.17	54.75	4.23	10 59 37.70
6	11 1 39.08	38.81	6 14 12.9	14.6	9.019	56.15	1 55.15	54.99	4.20	11 3 34.26
7	11 5 15.45	15.13	5 51 42.2	44.2	9.012	56.40	2 15.32	55.23	4.17	11 7 30.81
8	11 8 51.64	51.27	5 29 5.7	8.1	9.005	56.63	2 35.68	55.48	4.15	11 11 27.36
9	11 12 27.66	27.24	5 6 23.6	26.3	8.998	56.86	2 56.20	55.74	4.13	11 15 23.91
10	11 16 3.54	3.07	4 43 36.4	39.4	8.992	57.07	3 16.87	56.00	4.11	11 19 20.47
11	11 19 39.28	38.76	4 20 44.4	47.8	8.987	57.26	3 37.67	56.26	4.09	11 23 17.02
12	11 23 14.91	14.34	3 57 47.9	51.6	8.982	57.44	3 58.58	56.52	4.08	11 27 13.57
13	11 26 50.44	49.82	3 34 47.2	51.2	8.978	57.60	4 19.60	56.78	4.07	11 31 10.12
14	11 30 25.90	25.22	3 11 42.8	47.2	8.976	57.75	4 40.70	57.04	4.06	11 35 6.68
15	11 34 1.30	0.57	2 48 35.0	39.8	8.974	57.89	5 1.85	57.31	4.06	11 39 3.23
16	11 37 36.66	35.87	2 25 24.1	29.2	8.973	58.01	5 23.04	57.58	4.06	11 42 59.79
17	11 41 11.99	11.15	2 2 10.4	15.9	8.972	58.12	5 44.25	57.85	4.06	11 46 56.34
18	11 44 47.33	46.44	1 38 54.3	60.2	8.972	58.22	6 5.46	58.12	4.06	11 50 52.90
19	11 48 22.68	21.74	1 15 36.0	42.2	8.974	58.30	6 26.65	58.39	4.07	11 54 49.45
20	11 51 58.08	57.08	0 52 15.9	22.4	8.977	58.37	6 47.81	58.66	4.08	11 58 46.01
21	11 55 33.55	32.50	0 28 54.3	61.2	8.980	58.43	7 8.89	58.93	4.09	12 2 42.56
22	11 59 9.11	8.01	+ 0 5 31.5	38.7	8.984	58.48	7 29.89	59.20	4.10	12 6 39.12
23	12 2 44.79	43.64	− 0 17 52.3	44.7	8.989	58 50	7 50.76	59.47	4.12	12 10 35.67
24	12 6 20.62	19.41	0 41 16.6	8.7	8.996	58.52	8 11.48	15 59.74	4.14	12 14 32.22
25	12 9 56.60	55.34	1 4 41.1	32.8	9.004	58.53	8 32.04	16 0.01	4.17	12 18 28.77
26	12 13 32.77	31.46	1 27 65.6	57.0	9.012	58.52	8 52.41	0.28	4.20	12 22 25.33
27	12 17 9.16	7.79	1 51 29.7	20.8	9.021	58.49	9 12.58	0.55	4.23	12 26 21.88
28	12 20 45.78	44.36	2 14 53.1	43.9	9.031	58.45	9 32.52	0.82	4.26	12 30 18.44
29	12 24 22.66	21.19	2 38 15.4	5.9	9.043	58.40	9 52.20	1.09	4.30	12 34 14.99
30	12 27 59.82	58.30	3 1 36.3	26.5	9.055	58.33	10 11.59	1.36	4.34	12 38 11.55
Oct. 1	12 31 37.28	35.71	3 24 55.5	45.4	9.067	58.25	10 30.67	1.63	4.38	12 42 8.10
2	12 35 15.05	13.43	3 48 12.5	2.1	9.081	58.15	10 49.44	1.90	4.43	12 46 4.65
3	12 38 53.16	51.49	4 11 26.9	16.3	9.095	58.04	11 7.88	2.18	4.48	12 50 1.20
4	12 42 31.63	29.91	4 34 38.4	27.6	9.110	57.90	11 25.98	2.46	4.53	12 53 57.76
5	12 46 10.46	8.69	4 57 46.7	35.6	9.126	57.76	11 43.75	2.73	4.58	12 57 54.31
6	12 49 49.68	47.87	5 20 51.3	39.9	9.143	57.59	12 1.05	3.01	4.64	13 1 50.87
7	12 53 29.31	27.45	5 43 51.8	40.2	9.160	57.42	12 17.96	3.28	4.70	13 5 47.42
8	12 57 9.36	7.45	6 6 47.8	36.0	9.178	57.23	12 34.45	3.56	4.76	13 9 43.98
9	13 0 49.85	47.89	6 29 39.0	26.9	9.196	57.02	12 50.52	3.84	4.83	13 13 40.53
10	13 4 30.79	28.79	6 52 24.9	12.6	9.215	56.79	13 6.14	4.12	4.90	13 17 37.09
11	13 8 12.20	10.16	7 14 65.1	52.6	9.235	56.55	13 21.28	4.40	4.98	13 21 33.64
12	13 11 54.09	52.01	7 37 39.3	26.6	9.256	56.29	13 35.94	4.68	5.06	13 25 30.19
13	13 15 36.49	34.36	7 59 67.0	54.1	9.278	56.02	13 50.10	4.97	5.14	13 29 26.74
14	13 19 19.40	17.23	8 22 28.0	15.0	9.300	55.72	14 3.76	5.25	5.22	13 33 23.30
15	13 23 2.85	0.64	8 44 41.7	28.6	9.322	55.41	14 16.87	5.53	5.30	13 37 19.85
16	13 26 46.86	44.61	9 6 47.8	34.6	9.345	55.09	14 29.42	5.81	5.38	13 41 16.41
17	13 30 31.43	29.15	9 28 46.1	32.8	9.369	54.76	14 41.39	6.09	5.47	13 45 12.96
18	13 34 16.60	14.28	9 50 36.0	22.6	9.395	54.40	14 52.78	6.37	5.56	13 49 9.52
19	13 38 2.57	0.01	10 12 17.3	3.8	9.421	54.03	15 3.57	6.64	5.65	13 53 6.07
20	13 41 48.78	46.39	10 33 49.6	36.0	9.447	53.64	15 13.74	6.92	5.74	13 57 2.63
21	13 45 35.83	33.41	10 54 72.4	58.7	9.474	53.24	15 23.25	7.19	5.84	14 0 59.18
22	13 49 23.55	21.10	11 16 25.5	11.8	9.502	52.83	15 32.08	7.46	5.94	14 4 55.73
23	13 53 11.95	9.47	11 37 28.4	14.7	9.531	52.40	15 40.23	7.72	6.04	14 8 52.29
24	13 56 61.06	58.55	11 58 20.8	7.1	9.561	51.95	15 47.67	7.98	6.14	14 12 48.84
25	14 0 50.89	48.36	12 18 62.3	48.7	9.592	51.49	15 54.41	8.24	6.25	14 16 45.39
26	14 4 41.47	38.92	12 39 32.5	18.9	9.623	51.01	16 0.42	8.49	6.35	14 20 41.95
27	14 8 32.79	30.22	12 59 51.1	37.6	9.655	50.52	16 5.65	8.74	6.46	14 24 38.50
28	14 12 24.89	22.30	13 19 57.6	44.1	9.687	50.01	16 10.11	8.99	6.57	14 28 35.06
29	14 16 17.77	15.16	13 39 51.6	38.2	9.719	49.48	16 13.81	9.24	6.68	14 32 31.62
30	14 20 11.44	8.81	13 59 32.7	19.4	9.752	48.93	16 16.71	9.49	6.79	14 36 28.18
31	14 24 5.92	3.27	14 18 60.5	47.4	9.786	48.37	16 18.78	9.73	6.90	14 40 24.73
32	14 27 61.21	58.55	−14 38 14.6	1.5	9 820	−47.79	−16 20.05	16 9.98	1 7.01	14 44 21.29

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract $0^{s}.18$ from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion, Mean Noon.		Equation of Time for Apparent Noon,	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
1877.	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 1	14 27 61.21	58.55	-14 38 14.6	1.5	9.820	-47.79	-16 20.05	16 9.98	1 7.01	14 44 21.29
2	14 31 57.32	54.65	14 57 14.5	1.6	9.854	47.19	16 20.51	10.22	7.13	14 48 17.84
3	14 35 54.25	51.57	15 15 59.8	47.1	9.889	46.57	16 20.15	10.46	7.25	14 52 14.40
4	14 39 52.02	49.33	15 34 30.0	17.4	9.924	45.93	16 18.95	10.70	7.37	14 56 10.95
5	14 43 50.62	47.93	15 52 44.7	32.4	9.959	45.28	16 16.91	10.95	7.49	15 0 7.51
6	14 47 50.06	47.36	16 10 43.6	31.5	9.994	44.61	16 14.04	11.18	7.61	15 4 4.06
7	14 51 50.33	47.63	16 28 26.2	14.3	10.029	43.92	16 10.32	11.42	7.73	15 8 0.62
8	14 55 51.44	48.77	16 45 52.0	40.3	10.063	43.22	16 5.78	11.65	7.85	15 11 57.17
9	14 59 52.38	50.69	17 2 60.7	49.2	10.098	42.49	16 0.41	11.89	7.97	15 15 53.73
10	15 3 56.16	53.47	17 19 51.8	40.7	10.133	41.75	15 54.21	12.12	8.09	15 19 50.29
11	15 7 59.77	57.09	17 36 25.0	14.1	10.168	41.00	15 47.16	12.35	8.21	15 23 46.85
12	15 12 4.22	1.55	17 52 39.7	29.1	10.202	40.22	15 39.27	12.58	8.33	15 27 43.40
13	15 16 9.50	6.85	18 8 35.7	25.5	10.237	39.43	15 30.54	12.80	8.45	15 31 39.96
14	15 20 15.61	12.97	18 24 12.6	2.7	10.271	38.62	15 21.00	13.02	8.57	15 35 36.51
15	15 24 22.54	19.92	18 39 29.9	20.3	10.306	37.80	15 10.65	13.23	8.68	15 39 33.07
16	15 28 30.29	27.69	18 54 27.4	18.2	10.340	36.97	14 59.46	13.46	8.79	15 43 29.63
17	15 32 38.86	36.29	19 8 64.6	55.7	10.373	36.12	14 47.44	13.65	8.91	15 47 26.19
18	15 36 48.26	45.73	19 23 21.2	12.6	10.407	35.25	14 34.61	13.85	9.02	15 51 22.74
19	15 40 58.47	55.97	19 37 16.8	8.5	10.441	34.37	14 20.96	14.05	9.14	15 55 19.30
20	15 45 9.49	7.03	19 50 51.2	43.2	10.475	33.48	14 6.51	14.25	9.25	15 59 15.86
21	15 49 21.32	18.89	20 3 63.9	56.3	10.509	32.56	13 51.24	14.44	9.36	16 3 12.42
22	15 53 33.94	31.55	20 16 54.5	47.2	10.542	31.64	13 35.18	14.62	9.47	16 7 8.97
23	15 57 47.35	45.00	20 29 22.7	15.8	10.575	30.71	13 18.33	14.80	9.58	16 11 5.53
24	16 1 61.55	59.24	20 41 28.3	21.8	10.608	29.75	13 0.70	14.98	9.68	16 15 2.09
25	16 6 16.53	14.27	20 53 10.8	4.7	10.640	28.78	12 42.27	15.14	9.78	16 18 58.65
26	16 10 32.27	30.06	21 4 29.9	24.1	10.671	27.80	12 23.09	15.30	9.88	16 22 55.20
27	16 14 48.75	46.59	21 15 25.3	19.8	10.701	26.81	12 3.18	15.46	9.98	16 26 51.76
28	16 19 5.96	3.86	21 25 56.6	51.4	10.731	25.81	11 42.54	15.62	10.08	16 30 48.32
29	16 23 23.88	21.83	21 35 63.5	58.7	10.761	24.78	11 21.17	15.78	10.18	16 34 44.88
30	16 27 42.51	40.52	21 45 45.8	41.4	10.790	23.74	10 59.10	15.93	10.27	16 38 41.43
Dec. 1	16 31 61.80	59.87	21 54 63.2	59.1	10.817	22.69	10 36.36	16.08	10.36	16 42 37.99
2	16 36 21.74	19.87	22 3 55.2	51.5	10.843	21.64	10 12.98	16.22	10.44	16 46 34.55
3	16 40 42.29	40.49	22 12 21.6	18.2	10.868	20.56	9 48.99	16.36	10.52	16 50 31.11
4	16 45 3.43	1.70	22 20 22.1	19.0	10.892	19.48	9 24.40	16.49	10.60	16 54 27.67
5	16 49 25.13	23.47	22 27 56.6	53.8	10.915	18.39	8 59.26	16.62	10.67	16 58 24.23
6	16 53 47.38	45.79	22 35 4.7	2.2	10.936	17.29	8 33.58	16.75	10.74	17 2 20.78
7	16 58 10.12	8.61	22 41 46.3	44.1	10.956	16.17	8 7.38	16.88	10.81	17 6 17.34
8	17 2 33.34	31.91	22 47 61.0	59.1	10.976	15.05	7 40.70	17.00	10.87	17 10 13.90
9	17 6 56.99	55.64	22 53 48.8	47.1	10.993	13.92	7 13.61	17.12	10.93	17 14 10.46
10	17 11 21.04	19.77	22 59 9.4	7.9	11.009	12.79	6 46.12	17.23	10.99	17 18 7.02
11	17 15 45.46	44.28	23 4 2.6	1.3	11.024	11.65	6 18.25	17.34	11.04	17 22 3.58
12	17 20 10.23	9.13	23 8 28.4	27.3	11.039	10.51	5 50.04	17.45	11.09	17 26 0.13
13	17 24 35.30	34.28	23 12 26.6	25.7	11.051	9.36	5 21.51	17.55	11.13	17 29 56.69
14	17 28 60.65	59.71	23 15 57.0	56.3	11.062	8.20	4 52.70	17.65	11.17	17 33 53.25
15	17 33 26.25	25.40	23 18 59.5	58.9	11.072	7.03	4 23.65	17.74	11.20	17 37 49.81
16	17 37 52.07	51.31	23 21 34.1	33.7	11.080	5.86	3 54.38	17.83	11.23	17 41 46.37
17	17 42 18.07	17.41	23 23 40.7	40.4	11.086	4.69	3 24.93	17.91	11.25	17 45 42.93
18	17 46 44.22	43.65	23 25 19.2	19.0	11.092	3.52	2 55.32	17.98	11.27	17 49 39.48
19	17 51 10.49	10.01	23 26 29.6	29.4	11.096	2.35	2 25.59	18.05	11.29	17 53 36.04
20	17 55 36.87	36.49	23 27 11.7	11.6	11.099	- 1.17	1 55.77	18.11	11.30	17 57 32.60
21	18 0 3.31	3.02	23 27 25.5	25.5	11.101	+ 0.01	1 25.88	18.17	11.31	18 1 29.16
22	18 4 29.79	29.59	23 27 11.1	11.1	11.103	1.19	0 55.94	18.22	11.31	18 5 25.72
23	18 8 56.27	56.16	23 26 28.4	28.4	11.102	2.37	- 0 26.01	18.26	11.31	18 9 22.28
24	18 13 22.73	22.71	23 25 17.5	17.4	11.100	3.54	+ 0 3.89	18.30	11.30	18 13 18.84
25	18 17 49.13	49.21	23 23 38.3	38.2	11.097	4.72	0 33.71	18.35	11.29	18 17 15.40
26	18 22 15.44	15.61	23 21 30.9	30.8	11.093	5.89	1 3.45	18.39	11.27	18 21 11.96
27	18 26 41.62	41.88	23 18 55.3	55.2	11.087	7.07	1 33.07	18.43	11.25	18 25 8.52
28	18 31 7.66	8.01	23 15 51.6	51.3	11.080	8.24	2 2.54	18.46	11.22	18 29 5.08
29	18 35 33.50	33.94	23 12 19.8	19.4	11.072	9.40	2 31.81	18.49	11.19	18 33 1.64
30	18 39 59.13	59.66	23 8 20.1	19.6	11.063	10.56	3 0.86	18.52	11.16	18 36 58.19
31	18 44 24.49	25.12	23 3 52.6	52.0	11.052	11.72	3 29.65	18.54	11.13	18 40 54.75
32	18 48 49.57	50.28	-22 58 57.3	56.5	11.039	+12.88	+ 3 58.17	16 18.56	1 11.09	18 44 51.31

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract $0^s.19$ from the Sidereal Interval.

WASHINGTON MERIDIAN.

Date. 1877.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.	Date. 1877.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.
	h m	m	s				h m	m	s		
Jan. 0	13 29.53	2.597	76.27	45 .. 50	II.						
1	14 29.08	2.363	73.10	51 .. 55	II.	Mar. 1	14 12.87	2.026	67.75	69 .. 75	II.
2	15 23.02	2.148	69.82	56 .. 60	II.	2	15 1.76	2.055	68.29	75 .. 81	II.
3	16 12.65	1.996	67.41	60 .. 66	II.	3	15 51.71	2.111	69.25	81 .. 85	II.
4	16 59.44	1.912	66.03	65 .. 70	II.	4	16 43.13	2.172	70.25	86 .. 91	II.
5	17 44.89	1.886	65.63	69 .. 75	II.	5	17 35.80	2.211	70.91	91 .. 95	II.
6	18 30.36	1.911	66.04	75 .. 80	II.	6	18 28.92	2.207	70.84	96 .. 101	II.
7	19 16.94	1.976	67.06	80 .. 84	II.	7	19 21.37	2.155	69.99	101 .. 106	II.
8	20 5.36	2.060	68.34	84 .. 89	II.	8	20 12.04	2.062	68.48	107 .. 112	II.
9	20 55 75	2.136	69.48	89 .. 94	II.	9	21 0.21	1.951	66.61	112 .. 117	II.
10	21 47.62	2.177	70.04		II.	10	21 45.71	1.844	64.76	117 .. 123	II.
11	22 39.82	2.164	69.78		II.	11	22 28.86	1.756	63.23		II.
12	23 31.07	2.097	68.69		II.	12	23 10.26	1.701	62.24		II.
14	0 20.19	1.993	67.02		I.	13	23 50.83	1.686	61.95		II.
15	1 6.63	1.877	65.15		I.	15	0 31.50	1.711	62.40		I.
16	1 50.38	1.773	63.47		I.	16	1 13.35	1.784	63.65		I.
17	2 31.97	1.698	62.26	126 .. 131	I.	17	1 57.51	1.904	65.68		I.
18	3 12.20	1.662	61.70	130 .. 135	I.	18	2 45.06	2.066	68.36	13 .. 18	I.
19	3 52.12	1.673	61.94	135 .. 2	I.	19	3 36.84	2.253	71.34	19 .. 24	I.
20	4 32.90	1.735	63.07	1 .. 7	I.	20	4 33.10	2.430	74.10	24 .. 29	I.
21	5 15.85	1.854	65.11	7 .. 12	I.	21	5 33.05	2.550	75.91	30 .. 35	I.
22	6 2.34	2.032	68.04	13 .. 18	I.	22	6 34.78	2.573	76.26	36 .. 41	I.
23	6 53.76	2.261	71.60	17 .. 22	I.	23	7 35.84	2.499	75.20	42 .. 47	I.
24	7 50.96	2.506	75.22	23 .. 28	I.	24	8 34.28	2.365	73.07	49 .. 53	I.
25	8 53.63	2.701	77.99	29 .. 34	I.	25	9 29.29	2.222	70.83	53 .. 57	I.
26	9 59.68	2.774	78.96	36 .. 40	I.	26	10 21.16	2.108	68.99	58 .. 62	I.
27	11 5.67	2.699	77.82	41 .. 47	I.	27	11 10.85	2.042	67.90	62 .. 67	I.
28	12 8.43	2.520	75.38	48 .. 53	I.	28	11 59.59	2.028	67.66	62 .. 72	I.
29	13 6.42	2.315	72.17	53 .. 58	II.	29	12 48.57	2.061	68.18	73 .. 78	II.
30	13 59.78	2.141	69.54	58 .. 62	II.	30	13 38.75	2.125	69.24	78 .. 82	II.
31	14 49.64	2.025	67.76	62 .. 67	II.	31	14 30.62	2.198	70.46	82 .. 87	II.
Feb. 1	15 37.43	1.967	66.92	68 .. 72	II.	Apr. 1	15 24.12	2.254	71.41	88 .. 94	II.
2	16 24.51	1.965	66.95	72 .. 78	II.	2	16 18.46	2.264	71.62	95 .. 99	II.
3	17 12.10	2.005	67.62	78 .. 82	II.	3	17 12.37	2.218	70.95	100 .. 104	II.
4	18 0.96	2.070	68.65	82 .. 87	II.	4	18 4.56	2.123	69.49	105 .. 110	II.
5	18 51.45	2.135	69.68	87 .. 94	II.	5	18 54.09	2.003	67.55	110 .. 116	II.
6	19 43.25	2.176	70.27	94 .. 99	II.	6	19 40.69	1.883	65.57	116 .. 121	II.
7	20 35.54	2.171	70.13	99 .. 104	II.	7	20 24.61	1.783	63.84	121 .. 126	II.
8	21 27.08	2.116	69.20	104 .. 108	II.	8	21 6.52	1.717	62.66	126 .. 131	II.
9	22 16.83	2.024	67.64		II.	9	21 47.32	1.690	62.11	130 .. 135	II.
10	23 4.08	1.914	65.81		II.	10	22 28.00	1.708	62.37		II.
11	23 48.74	1.810	64.05		II	11	23 9.68	1.774	63.44		II.
13	0 31.13	1.727	62.65		I.	12	23 53.53	1.888	65.32		II.
14	1 11.90	1.678	61.84		I.	14	0 40.66	2.046	67.89		I.
15	1 52.01	1.671	61.74		I.	15	1 31.95	2.233	70.83		I.
16	2 32.45	1.708	62.46	138 .. 5	I.	16	2 27.78	2.414	73.60		I.
17	3 14.37	1.795	64.00	4 .. 10	I.	17	3 27.41	2.540	75.58	28 .. 33	I.
18	3 59.00	1.933	66.36	9 .. 14	I.	18	4 28.97	2.569	76.07	34 .. 39	I.
19	4 47.53	2.119	69.38	15 .. 20	I.	19	5 29.95	2.496	75.01	40 .. 45	I.
20	5 40.90	2.331	72.69	21 .. 26	I.	20	6 28.25	2.356	72.96	46 .. 51	I.
21	6 39.29	2.527	75.62	27 .. 31	I.	21	7 22.92	2.203	70.59	52 .. 56	I.
22	7 41.63	2.648	77.35	32 .. 37	I.	22	8 14.20	2.077	68.58	56 .. 60	I.
23	8 45.52	2.652	77.33	38 .. 43	I.	23	9 3.00	2.000	67.28	60 .. 66	I.
24	9 48.10	2.547	75.73	44 .. 50	I.	24	9 50.61	1.978	66.85	66 .. 71	I.
25	10 47.36	2.387	73.29	51 .. 55	I.	25	10 38.31	2.007	67.26	70 .. 75	I.
26	11 42.65	2.227	70.82	56 .. 60	I.	26	11 27.22	2.076	68.30	75 .. 81	I.
27	12 34.54	2.107	68.97	60 .. 65	II.	27	12 18.09	2.167	69.76	81 .. 85	II.
28	13 24.18	2.040	67.94	65 .. 70	II.	28	13 11.18	2.252	71.10	86 .. 91	II.
29	14 12.87	2.026	67.75	69 .. 75	II.	29	14 5.86	2.295	71.84	92 .. 96	II.
						30	15 0.88	2.277	71.62	96 .. 101	II
						31	15 54.67	2.195	70.44	102 .. 107	II.

NOTE.—The numbers in the column of Stars indicate those of the list of Moon-Culminating Stars, pp. 333-336, which are within 30^{m} of the Moon in right ascension.

WASHINGTON MERIDIAN.

Date. 1877.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.	Date. 1877.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.
	h m	m	s				h m	m	s		
May 1	15 54.67	2.195	70.44	102 . . 107	II.	July 1	16 53.75	1.644	61.44	133 . . 138	II.
2	16 45.92	2.072	68.56	108 . . 114	II.	2	17 33.68	1.692	62.29	138 . . 5	II.
3	17 34.01	1.937	66.43	114 . . 118	II.	3	18 15.42	1.796	64.04	4 . . 10	II.
4	18 18.99	1.817	64.49	118 . . 124	II.	4	19 0.34	1.957	66.69	9 . . 14	II.
5	19 1.48	1.730	62.98	123 . . 129	II.	5	19 49.76	2.170	70.01	15 . . 20	II.
6	42.35	1.684	62.13	129 . . 134	II.	6	20 44.64	2.406	73.54	21 . . 26	II.
7	22.60	1.685	62.11	132 . . 138	II.	7	21 44.98	2.612	76.52		II.
8	3.65	1.737	62.94	137 . . 5	II.	8	20 49.23	2.717	77.98		II.
9	46.43	1.842	64.60		II.	9	23 54.36	2.685	77.46		II.
10	32.43	1.997	67.10		II.	11	0 57.15	2.536	75.33		I.
11	23 22.63	2.194	70.16		II.	12	1 55.71	2.344	72.52		I.
13	0 17.81	2.403	73.32		I.	13	2 49.76	2.170	69.93		I.
14	1 17.61	2.567	75.79		I.	14	3 40.23	2.047	68.06	60 . . 65	I.
15	20.23	2.633	76.79		I.	15	4 28.49	1.985	67.12	66 . . 70	I.
16	23.05	2.577	76.02	39 . . 43	I.	16	5 15.96	1.982	67.09	69 . . 75	I.
17	[illegible]	2.424	73.91	44 . . 50	I.	17	6 3.98	2.027	67.79	75 . . 81	I.
18	[illegible]	2.250	71.26	50 . . 55	I.	18	6 53.46	2.101	68.98	81 . . 85	I.
19	[illegible]	2.093	68.83	56 . . 59	I.	19	7 44.88	2.182	70.18	86 . . 91	I.
20	0.42	1.986	67.10	59 . . 64	I.	20	8 38.00	2.237	71.00	91 . . 95	I.
21	47.19	1.936	66.26	64 . . 68	I.	21	9 31.89	2.242	71.00	96 . . 101	I.
22	8 33.63	1.944	66.34	68 . . 74	I.	22	10 25.15	2.185	70.06	102 . . 106	I.
23	9 20.90	2.002	67.20	73 . . 79	I.	23	11 16.40	2.079	68.36	106 . . 113	I.
24	10 9.98	2.093	68.61	79 . . 83	I.	24	12 4.76	1.950	66.29	112 . . 118	I.
25	11 1.44	2.194	70.14	83 . . 88	I.	25	12 50.02	1.825	64.23	118 . . 123	II.
26	11 55.11	2.271	71.30	89 . . 94	II.	26	13 32.53	1.723	62.54	123 . . 128	II.
27	12 50.03	2.292	71.65	95 . . 100	II.	27	14 12.99	1.655	61.44	128 . . 133	II.
28	13 44.60	2.243	70.95	101 . . 105	II.	28	14 52.32	1.630	61.07	132 . . 137	II.
29	14 37.25	2.135	69.44	106 . . 111	II.	29	15 31.60	1.651	61.49	136 . . 3	II.
30	15 26.86	1.908	67.42	111 . . 117	II.	30	16 11.96	1.722	62.75	3 . . 8	II.
31	16 13.15	1.862	65.25	116 . . 122	II.	31	16 54.64	1.845	64.88	8 . . 13	II.
June 1	16 56.48	1.753	63.35	122 . . 126	II.	Aug. 1	70 40.91	2.019	67.75	13 . . 18	II.
2	17 37.64	1.683	62.12	126 . . 131	II.	2	18 31.86	2.233	71.10	17 . . 23	II.
3	18 17.63	1.658	61.71	131 . . 136	II.	3	19 28.14	2.451	74.38	24 . . 29	II.
4	18 57.65	1.684	62.14	135 . . 2	II.	4	20 29.20	2.619	76.76	30 . . 35	II.
5	19 38.92	1.765	63.47	1 . . 8	II.	5	21 33.04	2.677	77.53		II.
6	20 22.80	1.902	65.70	7 . . 12	II.	6	22 36.79	2.613	76.53		II.
7	21 10.61	2.093	68.69		II.	7	23 37.84	2.466	74.34		II.
8	22 3.51	2.320	72.13		II.	9	0 34.98	2.300	71.84		I.
9	23 1.88	2.537	75.33		II.	10	1 28.42	2.163	69.78		I.
11	0 4.70	2.677	77.34		I.	11	2 19.18	2.078	68.51		I.
12	1 9.41	2.686	77.49		I.	12	3 8.61	2.050	68.13	68 . . 72	I.
13	2 12.69	2.567	75.90		I.	13	3 57.97	2.071	68.52	72 . . 78	I.
14	3 12.12	2.380	73.10	49 . . 53	I.	14	4 48.29	2.127	69.45	79 . . 83	I.
15	4 6.90	2.191	70.28	54 . . 57	I.	15	5 40.15	2.194	70.51	83 . . 88	I.
16	4 57.59	2.044	68.06	58 . . 62	I.	16	6 33.49	2.245	71.29	89 . . 94	I.
17	5 45.48	1.958	66.66	62 . . 67	I.	17	7 27.57	2.252	71.35	95 . . 100	I.
18	6 32.02	1.931	66.23	67 . . 72	I.	18	8 21.16	2.203	70.56	100 . . 105	I.
19	7 18.60	1.960	66.68	72 . . 77	I.	19	9 12.96	2.107	68.97	105 . . 111	I.
20	8 6.45	2.033	67.78	77 . . 81	I.	20	10 2.07	1.983	66.93	111 . . 116	I.
21	8 56.73	2.128	69.23	82 . . 86	I.	21	10 48.14	1.858	64.84	116 . . 122	I.
22	9 48.56	2.217	70.55	86 . . 93	I.	22	11 31.38	1.751	63.02	121 . . 127	I.
23	10 42.47	2.266	71.25	93 . . 98	I.	23	12 12.45	1.677	61.72	126 . . 131	II.
24	11 36.84	2.252	71.01	99 . . 104	I.	24	12 52.17	1.639	61.08	132 . . 136	II.
25	12 30.06	2.172	69.79	104 . . 109	II.	25	13 31.46	1.641	61.18	135 . . 2	II.
26	13 20.75	2.047	67.86	109 . . 115	II.	26	14 11.32	1.688	62.06	2 . . 7	II.
27	14 8.24	1.912	65.71	115 . . 120	II.	27	14 52.89	1.786	63.75	6 . . 11	II
28	14 52.58	1.788	63.72	119 . . 125	II.	28	15 37.39	1.928	66.15	11 . . 16	II.
29	15 34.33	1.697	62.24	124 . . 130	II.	29	16 25.68	2.102	69.07	16 . . 21	II.
30	16 14.37	1.647	61.44	129 . . 134	II.	30	17 18.42	2.298	72.13	21 . . 27	II.
31	16 53.75	1.644	61.44	133 . . 138	II.	31	18 15.80	2.473	74.72	28 . . 32	II.

NOTE.—The numbers in the column of Stars indicate those of the list of Moon-Culminating Stars, pp. 333-336, which a
[illegible] in right ascension.

WASHINGTON MERIDIAN.

Date. 1877.	Mean Time of Meridian Transit.		Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.	Date. 1877.	Mean Time of Meridian Transit.		Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.
	h	m	m	s				h	m	m	s		
Sept. 1	19	16.54	2.570	76.16	34 .. 38	II.	Nov. 1	21	20.21	2.046	67.84	66 .. 71	II.
2	20	18.50	2.572	76.10	39 .. 44	II.	2	22	9.93	2.106	68.72		II.
3	21	19.32	2.483	74.71		II.	3	23	1.57	2.203	70.19		II.
4	22	17.36	2.352	72.70		II.	4	23	55.73	2.310	71.83		I.
5	23	12.27	2.228	70.78		II.	6	0	52.22	2.389	73.06		I.
7	0	4.62	2.143	69.44		I.	7	1	49.92	2.404	73.34		I.
8	0	55.54	2.108	68.90		I.	8	2	47.00	2.337	72.41		I.
9	1	46.21	2.123	69.19		I.	9	3	41.63	2.206	70.49	105 .. 109	I.
10	2	37.71	2.174	70.05	76 .. 81	I.	10	4	32.66	2.045	68.02	110 .. 116	I.
11	3	30.67	2.240	71.15	82 .. 86	I.	11	5	19.83	1.890	65.55	116 .. 121	I.
12	4	25.12	2.294	71.99	86 .. 93	I.	12	6	3.61	1.765	63.48	122 .. 126	I.
13	5	20.37	2.302	72.19	93 .. 98	I.	13	6	44.89	1.682	62.04	126 .. 131	I.
14	6	15.19	2.255	71.47	99 .. 104	I.	14	7	24.77	1.644	61.34	130 .. 135	I.
15	7	8.23	2.156	69.90	104 .. 109	I.	15	8	4.18	1.654	61.46	135 .. 2	I.
16	7	58.47	2.028	67.83	109 .. 115	I.	16	8	44.51	1.714	62.42	1 .. 6	I.
17	8	45.54	1.897	65.62	115 .. 120	I.	17	9	26.85	1.823	64.19	6 .. 11	I.
18	9	29.64	1.783	63.65	119 .. 125	I.	18	10	12.38	1.978	66.66	11 .. 16	I.
19	10	11.34	1.699	62.17	124 .. 130	I.	19	11	2.03	2.164	69.56	15 .. 21	I.
20	10	51.49	1.653	61.33	129 .. 134	I.	20	11	56.24	2.350	72.37	21 .. 27	II.
21	11	31.02	1.647	61.20	134 .. 138	I.	21	12	54.45	2.488	74.45	28 .. 33	II.
22	12	10.30	1.684	61.83	138 .. 5	II.	22	13	54.95	2.533	75.18	34 .. 38	II.
23	12	52.20	1.765	63.23	4 .. 10	II.	23	14	55.28	2.476	74.40	39 .. 44	II.
24	13	35.94	1.887	65.31	9 .. 14	II.	24	15	53.28	2.348	72.56	45 .. 50	II.
25	14	23.06	2.045	67.92	15 .. 20	II.	25	16	47.84	2.200	70.35	51 .. 55	II.
26	15	14.21	2.218	70.72	20 .. 25	II.	26	17	39.05	2.076	68.42	56 .. 59	II.
27	16	9.40	2.376	73.18	26 .. 30	II.	27	18	27.85	1.999	67.22	60 .. 64	II.
28	17	7.83	2.477	74.74	30 .. 36	II.	28	19	15.45	1.979	66.88	64 .. 68	II.
29	18	7.67	2.493	74.98	37 .. 42	II.	29	20	3.28	2.016	67.40	68 .. 74	II.
30	19	6.91	2.430	74.00	43 .. 48	II.	30	20	52.60	2.101	68.68	75 .. 80	II.
Oct. 1	20	3.98	2.322	72.33	49 .. 53	II.	Dec. 1	21	44.36	2.215	70.39		II.
2	20	58.35	2.212	70.58	54 .. 58	II.	2	22	38.91	2.326	72.04		II.
3	21	50.38	2.132	69.27		II.	3	23	35.68	2.392	73.01		II.
4	22	41.05	2.099	68.71		II.	5	0	33.15	2.380	72.84		I.
5	23	31.53	2.117	68.96		II.	6	1	29.31	2.287	71.47		I.
7	0	22.98	2.177	69.91		I.	7	2	22.48	2.138	69.24		I.
8	1	16.19	2.259	71.22		I.	8	3	11.81	1.974	66.71	114 .. 118	I.
9	2	11.39	2.336	72.45		I.	9	3	57.34	1.826	64.37	118 .. 124	I.
10	3	7.98	2.370	73.04	91 .. 94	I.	10	4	39.74	1.715	62.54	123 .. 129	I.
11	4	4.65	2.339	72.64	96 .. 100	I.	11	5	19.99	1.648	61.43	129 .. 134	I.
12	4	59.75	2.242	71.20	101 .. 106	I.	12	5	59.23	1.630	61.15	132 .. 137	I.
13	5	51.96	2.104	69.08	107 .. 113	I.	13	6	38.65	1.663	61.72	137 .. 4	I.
14	6	40.67	1.957	66.69	112 .. 117	I.	14	7	19.48	1.748	63.11	3 .. 9	I.
15	7	25.99	1.825	64.48	118 .. 123	I.	15	8	2.98	1.886	65.33	9 .. 14	I.
16	8	8.49	1.725	62.75	121 .. 128	I.	16	8	50.34	2.068	68.21	13 .. 18	I.
17	8	49.09	1.666	61.65	128 .. 132	I.	17	9	42.45	2.277	71.37	19 .. 24	I.
18	9	28.78	1.649	61.29	132 .. 137	I.	18	10	39.47	2.467	74.16	25 .. 29	I.
19	10	8.61	1.677	61.73	136 .. 3	I.	19	11	40.28	2.581	75.82	30 .. 35	I.
20	10	49.65	1.751	62.93	3 .. 8	I.	20	12	42.53	2.583	75.83	37 .. 41	II.
21	11	32.99	1.868	64.86	8 .. 13	I.	21	13	43.45	2.478	74.35	43 .. 48	II.
22	12	19.59	2.022	67.36	13 .. 18	II.	22	14	41.07	2.320	72.05	49 .. 53	II
23	13	10.20	2.196	70.11	18 .. 23	II.	23	15	34.83	2.165	69.74	54 .. 58	II.
24	14	4.87	2.355	72.61	24 .. 29	II.	24	16	25.27	2.048	67.97	58 .. 62	II.
25	15	2.80	2.458	74.24	30 .. 35	II.	25	17	13.59	1.989	67.06	62 .. 67	II.
26	16	2.22	2.476	74.55	36 .. 40	II.	26	18	1.20	1.988	67.06	68 .. 72	II.
27	17	1.01	2.409	73.62	41 .. 46	II.	27	18	49.44	2.041	67.87	72 .. 78	II.
28	17	57.48	2.295	71.89	47 .. 51	II.	28	19	39.46	2.133	69.28	78 .. 82	II.
29	18	51.10	2.175	70.03	52 .. 56	II.	29	20	31.92	2.240	70.88	82 .. 87	II.
30	19	42.06	2.081	68.53	56 .. 60	II.	30	21	26.80	2.326	72.11		II.
31	20	31.35	2.036	67.77	61 .. 66	II.	31	22	23.12	2.354	72.48		II.
32	21	20.21	2.046	67.84	66 .. 71	II.	32	23	19.23	2.306	71.77		II.

NOTE.—The numbers in the column of Stars indicate those of the list of Moon-Culminating Stars, pp. 333-336, which are within 30^m of the Moon in right ascension.

MEAN PLACES FOR 1877.0.

No.	Name.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
1	B. A. C. 57 .	6.7	0 11 28.18	+3.067	+ 1 0 16.5	+20.02
2	*d* Piscium . .	6.5	0 14 16.21	3.086	7 30 26.4	20.06
3	51 Piscium (*pr.*) .	6	0 26 3.06	3.088	6 16 39.3	20.00
4	58 Piscium . .	5	0 40 36.46	3.122	11 18 13.0	19.80
5	δ Piscium . .	4.5	0 42 18.10	+3.109	+ 6 54 56.1	+19.71
6	ε PISCIUM . .	4	0 56 33.64	3.110	7 13 39.4	19.48
7	75 Piscium . .	6	1 0 5.54	3.150	12 17 51.9	19.45
8	ζ Piscium (*pr.*) .	5.4	1 7 18.35	3.131	6 55 28.2	19.14
9	η PISCIUM . .	4.3	1 24 54.12	+3.200	+14 42 41.2	+18.71
10	π Piscium . .	6	1 30 34.80	3.174	11 30 44.4	18.59
11	4 Arietis . . .	6	1 41 30.76	3.244	16 20 38.7	18.16
12	ι Arietis . . .	6	1 50 38.04	3.272	17 12 58.7	17.77
13	η Arietis . . .	5.6	2 5 54.98	+3.346	+20 37 55.2	+17.11
14	θ Arietis . . .	6.5	2 11 17.23	3.329	19 19 53.6	16.89
15	ν Arietis . . .	6.5	2 31 50.09	3.397	21 25 41.7	15.78
16	μ Arietis . . .	6.5	2 35 25.97	3.372	19 29 11.6	15.61
17	ρ Arietis . . .	6	2 49 29.72	+3.378	+17 31 54.3	+14.65
18	ε Arietis . . .	4.5	2 52 10.94	3.422	20 50 50.1	14.66
19	ζ ARIETIS . .	4.5	3 7 50.02	3.438	20 35 15.4	13.63
20	τ Arietis . . .	5	3 14 7.61	3.453	20 42 8.4	13.23
21	9 Tauri . . .	6	3 29 44.02	+3.516	+22 48 9.8	+12.19
22	17 Tauri . . .	4	3 37 34.53	3.552	23 43 31.7	11.65
23	η TAURI . . .	3	3 40 10.47	3.555	23 43 23.8	11.44
24	A Tauri . . .	5.4	3 57 25.49	3.538	21 44 38.6	10.16
25	*p* Tauri . . .	6	4 3 20.84	+3.647	+26 9 33.3	+ 9.78
26	φ Tauri . . .	5.6	4 12 47.37	3.677	27 3 20.5	9.00
27	υ Tauri . . .	5.4	4 18 56.96	3.582	22 31 59.2	8.53
28	B. A. C. 1444 .	6	4 33 38.04	3.750	28 22 29.8	7.34
29	*k* Tauri . . .	6.5	4 50 37.84	+3.666	+24 51 30.2	+ 5.89
30	B. A. C. 1648 .	6.7	5 13 16.03	3.763	27 49 48.5	4.01
31	β TAURI . . .	2	5 18 31.03	3.788	28 30 5.6	3.43
32	118 Tauri . . .	6	5 21 42.37	3.688	25 2 54.6	3.29
33	26 Aurigæ . .	6	5 30 44.19	+3.847	+30 25 2.4	+ 2.54
34	136 Tauri . . .	5	5 45 35.87	3.772	27 34 49.8	1.20
35	139 Tauri . . .	5.6	5 50 21.93	3.725	25 56 12.0	+ 0.84
36	κ Aurigæ . .	5.4	6 7 32.49	3.828	29 32 27.6	− 0.95
37	B. A. C. 2097 .	6.7	6 22 36.40	3.791	28 17 25.4	2.08
38	49 Aurigæ . .	6.5	6 27 27.33	+3.783	+28 6 58.2	− 2.42
39	ε Geminorum .	3.4	6 36 22.01	3.699	25 15 3.0	3.19
40	ω Geminorum .	6	6 54 55.14	3.662	24 23 20.2	4.77
41	τ Geminorum .	5.4	7 3 18.60	3.828	30 26 40.4	5.53
42	A Geminorum .	5.6	7 15 58.67	+3.668	+25 17 6.9	− 6.55

MEAN PLACES FOR 1877.0.

No.	Name.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
43	υ Geminorum .	4.5	7 28 20.67	+3.711	+27 10 2.9	− 7.63
44	β GEMINORUM .	1.2	7 37 47.28	3.681	28 19 18.3	8.34
45	φ GEMINORUM .	5	7 45 58.14	3.683	27 4 57.2	8.96
46	ω Cancri . . .	6	7 53 29.34	3.642	25 43 41.6	9.52
47	μ² Cancri . . .	6.5	8 0 31.56	+3.541	+21 56 21.3	−10.09
48	λ Cancri . . .	6	8 13 13.17	3.578	24 24 28.3	11.05
49	η Cancri . . .	6	8 25 35.72	3.482	20 51 27.7	11.93
50	γ Cancri . . .	4.5	8 36 10.01	3.484	21 54 36.4	12.61
51	ι² Cancri . . .	6	8 50 42.91	+3.358	+16 4 44.0	−13.49
52	ξ Cancri . . .	5	9 2 17.15	3.461	22 32 30.7	14.31
53	83 Cancri . . .	6	9 12 6.82	3.357	18 13 30.8	15.07
54	λ Leonis . . .	5.4	9 24 42.03	3.433	23 30 33.0	15.65
55	8 Leonis . . .	6	9 30 15.29	+3.319	+16 59 26.3	−15.85
56	ν Leonis . . .	5	9 51 36.32	3.237	13 1 50.9	17.00
57	α LEONIS . .	1.2	10 1 49.26	3.203	12 34 4.6	17.43
58	44 Leonis . . .	6	10 18 46.03	3.158	9 24 31.2	18.25
59	ρ LEONIS . .	4	10 26 20.09	+3.165	+ 9 56 20.6	−18.40
60	l LEONIS . .	5	10 42 47.45	3.159	11 11 45.1	18.93
61	d Leonis . . .	5	10 54 12.50	3.102	4 16 37.7	19.29
62	p⁵ Leonis . . .	5	11 7 28.33	3.085	0 35 56.9	19.58
63	σ Leonis . . .	4	11 14 47.63	+3.097	+ 6 42 10.6	−19.68
64	τ LEONIS . .	5	11 21 36.73	3.088	+ 3 32 1.0	19.79
65	υ LEONIS . . .	5.4	11 30 39.11	3.072	− 0 8 40.5	19.84
66	β Virginis . .	3.4	11 44 17.35	3.127	+ 2 27 27.2	20.29
67	B. A. C. 4043 .	6.7	11 52 45.31	+3.055	+ 1 12 55.3	−20.02
68	η VIRGINIS . .	3.4	12 13 36.82	3.069	+ 0 1 1.6	20.03
69	q Virginis . .	6	12 27 25.95	3.093	− 8 46 23.4	19.89
70	f Virginis . .	6	12 30 27.37	3.086	5 9 19.3	19.96
71	χ Virginis . .	5	12 32 54.30	+3.095	− 7 19 4.7	−19.89
72	ψ Virginis . .	5	12 47 57.57	3.118	8 52 13.9	19.63
73	49 Virginis . .	6	13 1 27.33	3.139	10 4 57.1	19.37
74	g Virginis . .	6	13 2 7.76	3.123	8 19 30.7	19.33
75	α VIRGINIS . .	1	13 18 42.91	+3.153	−10 31 6.4	−18.91
76	h Virginis . .	5	13 26 29.49	3.154	9 31 50.5	18.68
77	83 Virginis . .	6	13 37 51.87	3.229	15 33 39.6	18.32
78	89 Virginis . .	5	13 43 11.44	3.250	17 31 15.3	18.10
79	B. A. C. 4679 .	6.7	13 57 47.79	3.242	14 22 44.7	17.50
80	Piazzi XIII. 317	6	14 4 7.27	+3.260	−15 43 15.1	−17.25
81	λ Virginis . .	5.4	14 12 27.45	3.240	12 48 14.7	16.77
82	α² LIBRÆ . . .	2.3	14 44 4.55	3.307	15 31 44.9	15.19
83	12 Libræ . . .	6	14 47 11.70	3.472	24 8 13.5	14.98
84	γ Scorpii . .	3.4	14 56 52.56	+3.501	−24 47 49.7	−14.40

MEAN PLACES FOR 1877.0.

No.	Name.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
85	ι Libræ	5.4	15	5	13.05	+3.411	−19	19	28.9	−13.87
86	Piazzi xv. 96	6	15	25	32.54	3.427	19	14	58.0	12.60
87	Piazzi xv. 116	4.5	15	29	33.58	3.627	27	43	33.5	12.24
88	b Scorpii	5	15	43	35.04	3.596	25	22	32.5	11.28
89	π Scorpii	3	15	51	24.80	+3.619	−25	45	30.5	−10.73
90	δ SCORPII	2.3	15	53	3.75	3.537	22	16	9.8	10.54
91	c^1 Scorpii	5	16	4	44.13	3.693	27	36	18.0	9.68
92	σ Scorpii	3.4	16	13	42.88	3.638	25	17	44.0	8.97
93	α SCORPII	1.2	16	21	52.09	+3.669	−26	9	25.2	− 8.35
94	τ Scorpii	3.4	16	28	13.78	3.729	27	57	31.0	7.81
95	B. A. C. 5709	6	16	52	25.79	3.665	24	54	22.6	5.99
96	36 Ophiuchi	5	17	7	47.12	3.685	26	25	12.2	5.67
97	θ Ophiuchi	3.4	17	14	27.45	+3.682	−24	52	29.5	− 4.01
98	d Ophiuchi	5	17	19	29.91	3.821	29	45	15.4	3.73
99	B. A. C. 5909	6.7	17	24	6.09	3.718	26	10	26.8	3.22
100	3 Sagittarii	5	17	39	48.83	3.768	27	46	54.2	1.77
101	γ^2 SAGITTARII	3.4	17	57	54.43	+3.853	−30	25	24.5	− 0.40
102	Piazzi xviii. 24	6	18	10	21.48	3.759	27	5	8.9	+ 0.84
103	δ Sagittarii	3.4	18	13	7.16	3.841	29	52	43.1	1.09
104	λ Sagittarii	3	18	20	22.83	3.706	25	29	17.3	1.56
105	φ Sagittarii	4.3	18	37	58.42	+3.757	−27	6	56.3	+ 3.27
106	σ SAGITTARII	2.3	18	47	38.29	3.723	26	26	49.7	4.08
107	τ Sagittarii	4.3	18	59	15.62	3.753	27	50	52.1	4.90
108	ψ Sagittarii	6	19	7	59.95	3.685	25	27	56.9	5.88
109	χ Sagittarii	6	19	17	47.22	+3.656	−24	44	43.6	+ 6.60
110	h Sagittarii	5.4	19	29	13.24	3.660	25	9	10.1	7.61
111	53 Sagittarii	6	19	32	25.89	3.613	23	42	19.9	7.98
112	ω Sagittarii	5	19	48	18.20	3.685	26	37	26.4	9.23
113	A Sagittarii	5	19	51	27.31	+3.663	−26	31	36.5	+ 9.42
114	B. A. C. 6878	6.7	19	56	26.49	3.554	22	56	18.9	9.74
115	σ Capricorni	6.5	20	12	17.79	3.474	19	30	1.0	10.98
116	ρ Capricorni	5	20	21	50.53	3.429	18	13	6.1	11.66
117	υ Capricorni	6.5	20	33	2.72	+3.422	−18	34	10.9	+12.47
118	19 Capricorni	6	20	47	50.93	3.401	18	23	11.6	13.45
119	η Capricorni	5.6	20	57	24.14	3.426	20	20	24.1	14.00
120	θ Capricorni	4	20	59	1.93	3.383	17	43	10.7	14.10
121	φ Capricorni	5.6	21	8	37.77	3.424	21	9	34.8	14.77
122	ι Capricorni	4.5	21	15	24.04	+3.353	−17	21	22.1	+15.16
123	γ Capricorni	4.3	21	33	16.54	3.337	17	12	59.6	16.10
124	δ Capricorni	3	21	40	14.97	3.319	16	41	2.3	16.20
125	μ CAPRICORNI	5	21	46	35.33	3.279	14	7	45.6	16.78
126	ι Aquarii	4	21	59	47.52	+3.249	−14	27	55.7	+17.31

MEAN PLACES FOR 1877.0.

No.	Name.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
127	*e* Aquarii . .	5.6	22 4 3.16	+3.219	−12 10 5.7	+17.58
128	θ AQUARII . .	4.5	22 10 20.53	3.170	8 23 41.5	17.80
129	σ Aquarii . .	5.4	22 24 8.14	3.181	11 18 20.9	18.41
130	67 Aquarii . .	6	22 36 48.71	3.134	7 36 18.1	18.80
131	λ AQUARII . .	4	22 46 11.74	+3.131	− 8 14 0.0	+19.07
132	*h* Aquarii . .	6.5	22 58 45.19	3.136	8 21 22.2	19.40
133	φ Aquarii . .	4.5	23 7 57.19	3.112	6 42 41.5	19.38
134	96 Aquarii . .	6.5	23 13 1.30	3.115	5 47 44.8	19.66
135	14 Piscium . .	6	23 27 49.49	+3.084	− 1 55 35.2	+19.87
136	λ Piscium . .	5	23 35 46.28	3.064	+ 1 6 12.3	19.81
137	25 Piscium . .	6	23 46 46.70	3.070	+ 1 24 27.2	20.04
138	B. A. C. 8365 .	6.7	23 58 45.55	+3.076	− 1 11 10.5	+19.97

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.			FEBRUARY.			MARCH.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d	′ ″	′ ″	″	′ ″	′ ″	″	′ ″	′ ″	″
1.0	16 41.4	61 8.9	−0.92	16 14.6	59 30.5	−2.32	16 16.5	59 37.2	−2.03
1.5	16 37.8	60 55.6	1.28	16 6.9	59 2.0	2.42	16 9.5	59 11.7	2.20
2.0	16 33.1	60 38.3	1.58	15 58.9	58 32.6	2.45	16 2.2	58 44.7	2.31
2.5	16 27.5	60 17.7	1.82	15 50.9	58 3.1	2.44	15 54.5	58 16.6	2.36
3.0	16 21.2	59 54.6	2.01	15 42.9	57 33.9	2.39	15 46.8	57 48.1	2.36
3.5	16 14.4	59 29.6	2.14	15 35.2	57 5.8	2.29	15 39.1	57 20.0	2.32
4.0	16 7.2	59 3.2	2.22	15 28.0	56 39.0	2.16	15 31.6	56 52.6	2.24
4.5	15 59.8	58 36.2	2.25	15 21.1	56 14.0	2.01	15 24.5	56 26.5	2.12
5.0	15 52.6	58 9.3	2.23	15 14.8	55 50.9	1.84	15 17.9	56 2.0	1.96
5.5	15 45.3	57 42.8	2.18	15 9.1	55 29.9	1.66	15 11.7	55 39.4	1.79
6.0	15 38.3	57 17.1	2.09	15 4.0	55 11.0	1.48	15 6.2	55 19.0	1.60
6.5	15 31.7	56 52.7	1.98	14 59.5	54 54.4	1.29	15 1.2	55 0.9	1.41
7.0	15 25.4	56 29.7	1.85	14 55.6	54 40 0	1.10	14 57.0	54 45.3	1.20
7.5	15 19.6	56 8.4	1.71	14 52.3	54 27.9	0.92	14 53.5	54 32.2	0.99
8.0	15 14.2	55 48.7	1.57	14 49.5	54 17.9	0.74	14 50.6	54 21.6	0.78
8.5	15 9.4	55 30.7	1.43	14 47.4	54 9.9	0.58	14 48.3	54 13.4	0.57
9.0	15 4.9	55 14.3	1.29	14 45.8	54 4.0	0.42	14 46.8	54 7.8	0.38
9.5	15 0.9	54 59.7	1.15	14 44.6	53 59.9	0.27	14 45.9	54 4.4	0.19
10.0	14 57.4	54 46.7	1.01	14 44.0	53 57.5	−0.13	14 45.6	54 3.3	−0.01
10.5	14 54.3	54 35.4	0.88	14 43.8	53 56.8	+0.01	14 45.8	54 4.2	+0.16
11.0	14 51.6	54 25.6	0.75	14 44.0	53 57.6	0.13	14 46.6	54 7.1	0.31
11.5	14 49.4	54 17.3	0.63	14 44.6	53 59.8	0.24	14 47.9	54 11.7	0.45
12.0	14 47.5	54 10.4	0.52	14 45.6	54 3.4	0.35	14 49.5	54 17.9	0.58
12.5	14 46.0	54 4.9	0.41	14 46.9	54 8.2	0.45	14 51.6	54 25.5	0.69
13.0	14 44.8	54 0.6	0.30	14 48.5	54 14.1	0.54	14 54.0	54 34.4	0.79
13.5	14 44.0	53 57.7	0.19	14 50.4	54 21.1	0.63	14 56.8	54 44.4	0.88
14.0	14 43.6	53 56.0	−0.09	14 52.6	54 29.2	0.73	14 59.8	54 55.4	0.95
14.5	14 43.5	53 55.6	+0.02	14 55.2	54 38.5	0.82	15 3.0	55 7.2	1.01
15.0	14 43.7	53 56.4	0.13	14 58.0	54 49.1	0.92	15 6.4	55 19.7	1.06
15.5	14 44.3	53 58.6	0.24	15 1.2	55 0.7	1.02	15 9.9	55 32.7	1.11
16.0	14 45.3	54 2.2	0.36	15 4.7	55 13.5	1.12	15 13.6	55 46.4	1.16
16.5	14 46.7	54 7.3	0.49	15 8.5	55 27.5	1.22	15 17.5	56 0.5	1.19
17.0	14 48.5	54 14.0	0.63	15 12.6	55 42.8	1.32	15 21.4	56 15.1	1.23
17.5	14 50.7	54 22.2	0.76	15 17.2	55 59.3	1.43	15 25.5	56 29.9	1.25
18.0	14 53.5	54 32.2	0.90	15 22.0	56 17.1	1.53	15 29.6	56 45.1	1.28
18.5	14 56.7	54 44.0	1.06	15 27.2	56 36.1	1.64	15 33.9	57 0.7	1.31
19.0	15 0.4	54 57.7	1.22	15 32.7	56 56.3	1.73	15 38.2	57 16.6	1.33
19.5	15 4.6	55 13.2	1.38	15 38.5	57 17.7	1.82	15 42.6	57 32.7	1.35
20.0	15 9.4	55 30.7	1.54	15 44.6	57 40.0	1.89	15 47.0	57 49.0	1.37
20.5	15 14.6	55 50.3	1.70	15 50.8	58 3.1	1.94	15 51.5	58 5.5	1.37
21.0	15 20.5	56 11.6	1.85	15 57.2	58 26.6	1.97	15 56.0	58 21.9	1.37
21.5	15 26.8	56 34.8	2.00	16 3.7	58 50.3	1.96	16 0.4	58 38.3	1.35
22.0	15 33.6	56 59.6	2.13	16 10.0	59 13.5	1.91	16 4.8	58 54.3	1.32
22.5	15 40.7	57 25.9	2.24	16 16.1	59 35.9	1.82	16 9.0	59 9.8	1.25
23.0	15 48.2	57 53.4	2.32	16 21.8	59 56.9	1.68	16 13.0	59 24.3	1.16
23.5	15 55.9	58 21.6	2.37	16 27.1	60 16.0	1.59	16 16.6	59 37.5	1.04
24.0	16 3.6	58 50.1	2.36	16 31.5	60 32.3	1.24	16 19.8	59 49.2	0.89
24.5	16 11.3	59 18.3	2.30	16 35.1	60 45.5	0.95	16 22.4	59 58.9	0.71
25.0	16 18.7	59 45.3	2.19	16 37.7	60 55.1	0.63	16 24.3	60 6.1	0.49
25.5	16 25.6	60 10.7	2.01	16 39.2	61 0.4	+0.26	16 25.6	60 10.6	+0.25
26.0	16 31.8	60 33.5	1.77	16 39.4	61 1.3	−0.11	16 26.0	60 12.0	−0.01
26.5	16 37.2	60 53.2	1.48	16 38.4	60 57.7	0.49	16 25.5	60 10.3	0.28
27.0	16 41.5	61 9.1	1.14	16 36.2	60 49.5	0.86	16 24.1	60 5.2	0.57
27.5	16 44.6	61 20.5	0.75	16 32.8	60 37.0	1.22	16 21.8	59 56.7	0.85
28.0	16 46.4	61 27.0	+0.33	16 28.2	60 20.4	1.54	16 18.6	59 44.9	1.11
28.5	16 46.8	61 28.4	−0.10	16 22.8	60 0.3	1.81	16 14.5	59 30.0	1.36
29.0	16 45.7	61 24.6	0.53	16 16.5	59 37.2	2.03	16 9.7	59 12.3	1.58
29.5	16 43.3	61 15.7	0.94	16 9.5	59 11.7	2.20	16 4.2	58 52.1	1.76
30.0	16 39.5	61 1.9	1.32	16 2.2	58 44.7	2.31	15 58.2	58 30.1	1.90
30.5	16 34.6	60 43.9	1.65			2.36	15 51.8	58 6.7	1.99
31.0	16 28.8	60 22.3	1.93	Δs = .272 Δπ		2.36	15 45.2	57 42.4	2.04
31.5	16 22.0	59 57.6	−2.16			−2.32	15 38.5	57 17.8	−2.06

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.			MAY.			JUNE.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d	′ ″	′ ″	″	′ ″	′ ″	″	′ ″	′ ″	″
1.0	15 31.8	56 53.3	−2.03	15 6.2	55 18.9	−1.35	14 48.3	54 13.4	−0.15
1.5	15 25.3	56 29.3	1.96	15 2.0	55 3.5	1.21	14 48.2	54 12.8	+0.05
2.0	15 19.1	56 6.4	1.86	14 58.3	54 49.9	1.05	14 48.7	54 14.6	0.25
2.5	15 13.2	55 44.9	1.73	14 55.1	54 38.4	0.87	14 49.8	54 18.9	0.46
3.0	15 7.8	55 25.1	1.57	14 52.6	54 29.1	0.68	14 51.7	54 25 7	0.67
3.5	15 3.0	55 7.4	1.39	14 50.7	54 22.1	0.48	14 54.3	54 35.1	0.88
4.0	14 58.8	54 51.9	1.20	14 49.5	54 17.7	0.27	14 57.5	54 46.9	1.09
4.5	14 55.2	54 38.7	0.99	14 49.0	54 15.8	−0.05	15 1.3	55 1.2	1.29
5.0	14 52.4	54 28.1	0.78	14 49.2	54 16.4	+0.16	15 5.8	55 17.8	1.48
5.5	14 50.2	54 20.1	0.56	14 50.0	54 19.7	0.38	15 11.0	55 36.6	1.64
6.0	14 48.7	54 14.7	0.33	14 51.6	54 25.5	0.59	15 16.6	55 57.2	1.79
6.5	14 48.0	54 12.0	−0.12	14 53.9	54 33.8	0.79	15 22.6	56 19.4	1.91
7.0	14 47.9	54 11.8	+0.09	14 56.8	54 44.5	0.99	15 29.0	56 42.9	2.00
7.5	14 48.5	54 14.0	0.29	15 0.3	54 57.4	1.16	15 35.7	57 7.3	2.05
8.0	14 49.7	54 18.6	0.47	15 4.4	55 12.3	1.32	15 42.4	57 32.2	2.08
8.5	14 51.6	54 25.3	0.64	15 8.9	55 28.9	1.45	15 49.2	57 57.0	2.06
9.0	14 54.0	54 34.0	0.80	15 13.8	55 47.0	1.56	15 55.8	58 21.3	1.98
9.5	14 56.8	54 44.5	0.95	15 19.0	56 6.3	1.65	16 2.4	58 44.5	1.87
10.0	15 0.0	54 56.5	1.07	15 24.5	56 26.5	1.70	16 8.0	59 6.0	1.71
10.5	15 3.7	55 10.0	1.17	15 30.2	56 47.1	1.72	16 13.3	59 25.3	1.51
11.0	15 7.7	55 24.5	1.25	15 35.8	57 7.8	1.72	16 17.8	59 42.0	1.27
11.5	15 11.8	55 39.9	1.31	15 41.3	57 28.1	1.68	16 21.5	59 55.7	1.01
12.0	15 16.2	55 55.9	1.35	15 46.7	57 47.8	1.60	16 24.8	60 6.2	0.73
12.5	15 20.7	56 12.3	1.37	15 51.7	58 6.4	1.50	16 26.3	60 13.2	0.45
13.0	15 25.2	56 28.7	1.37	15 56.5	58 23.7	1.37	16 27.3	60 16.8	+0.16
13.5	15 29.6	56 45.1	1.35	16 0.7	58 39.2	1.22	16 27.3	60 17.0	−0.12
14.0	15 34.0	57 1.1	1.32	16 4.4	58 52.9	1.05	16 26.5	60 13.9	0.38
14.5	15 38.2	57 16.7	1.27	16 7.5	59 4.4	0.97	16 24.9	60 7.7	0.63
15.0	15 42.3	57 31 6	1.22	16 10.1	59 13.8	0.69	16 22.4	59 58.9	0.83
15.5	15 46.1	57 45.8	1.15	16 12.1	59 21.0	0.51	16 19.4	59 47.7	1.02
16.0	15 49.7	57 59.1	1.07	16 13.5	59 26.1	0.33	16 15.9	59 34.6	1.16
16.5	15 53.1	58 11.5	1.00	16 14.2	59 29.0	+0.16	16 11.8	59 20.0	1.27
17.0	15 56.3	58 23.1	0.93	16 14.5	59 30.0	0.00	16 7.5	59 4.3	1.35
17.5	15 59.2	58 33.8	0.85	16 14.3	59 29.1	−0.15	16 3.0	58 47.7	1.40
18.0	16 1.9	58 43.5	0.77	16 13.6	59 26.5	0.28	15 58.3	58 30.6	1.43
18.5	16 4.3	58 52.4	0.70	16 12.5	59 22.5	0.40	15 53.6	58 13.4	1.44
19.0	16 6.4	59 0.3	0.62	16 11.0	59 17.0	0.50	15 48.9	57 56.0	1.44
19.5	16 8.3	59 7.2	0.53	16 9.2	59 10.4	0.60	15 44.2	57 38.7	1.43
20.0	16 9.9	59 13.0	0.44	16 7.1	59 2.7	0.69	15 39.6	57 21.7	1.41
20.5	16 11.2	59 17.7	0.34	16 4.7	58 54.0	0.75	15 35.0	57 5.0	1.38
21.0	16 12.1	59 21.2	0.24	16 2.2	58 44.6	0.82	15 27.9	56 38.7	1.34
21.5	16 12.7	59 23.4	+0.12	15 59.3	58 34.3	0.89	15 26.3	56 32.8	1.30
22.0	16 12.9	59 24.0	−0.01	15 56.3	58 23.1	0.96	15 22.1	56 17.4	1.26
22.5	16 12.7	59 23.1	0.14	15 53.0	58 11.2	1.02	15 18.0	56 2.5	1.21
23.0	16 12.0	59 20.6	0.29	15 49.6	57 58.6	1.08	15 14.1	55 48.2	1.17
23.5	16 10.7	59 16.1	0.45	15 46.0	57 45.2	1.14	15 10.4	55 34.5	1.12
24.0	16 9.0	59 9.7	0.62	15 42.2	57 31.2	1.19	15 6.9	55 21.5	1.06
24.5	16 6.7	59 1.2	0.79	15 38.2	57 16.6	1.24	15 3.5	55 9.1	1.00
25.0	16 3.9	58 50.8	0.95	15 34.1	57 1.5	1.27	15 0.3	54 57.4	0.94
25.5	16 0.5	58 38.4	1.11	15 29.8	56 46.0	1.30	14 57.4	54 46.6	0.86
26.0	15 56.6	58 24.2	1.26	15 25.5	56 30.2	1.32	14 54.7	54 36.8	0.77
26.5	15 52.3	58 8.3	1.38	15 21.2	56 14.2	1.32	14 52.4	54 28.1	0.68
27.0	16 47.5	57 50.9	1.50	15 17.0	55 58.6	1.30	14 50.3	54 20.5	0.57
27.5	15 42.5	57 32.4	1.58	15 12.7	55 43.1	1.27	14 48.6	54 14.3	0.45
28.0	15 37.2	57 13.0	1.64	15 8.7	55 28.2	1.22	14 47.3	54 9.7	0.32
28.5	15 31.8	56 53.1	1.66	15 4.8	55 13.9	1.16	14 46.5	54 6.7	0.18
29.0	15 26.4	56 33.2	1.66	15 1.2	55 0.5	1.07	14 46.2	54 5.5	−0.02
29.5	15 21.0	56 13.4	1.63	14 57.9	54 48.4	0.95	14 46.4	54 6.3	+0.15
30.0	15 15.7	55 54.2	1.57	14 55.0	54 37.7	0.82	14 47.2	54 9.2	0.33
30.5	15 10.8	55 35.9	1.47	14 52.5	54 28.8	0.67	14 48.6	54 14.3	0.52
31.0	$\Delta s = .272\,\Delta\pi$		1.35	14 50.6	54 21.6	0.52	14 50.6	54 21.7	0.72
31.5			−1.21	14 49.2	54 16.4	−0.34	14 53.3	54 31.5	+0.91

FOR WASHINGTON MEAN NOON AND MIDNIGHT.									
Day of Month.	JULY.			AUGUST.			SEPTEMBER.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d	′ ″	′ ″	″	′ ″	′ ″	″	′ ″	′ ″	″
1.0	14 50.6	54 21.7	+0.72	15 14.6	55 50.2	+1.77	15 52.5	58 9.1	+2.15
1.5	14 53.3	54 31.5	0.91	15 20.7	56 12.4	1.93	15 59.6	58 35.2	2.18
2.0	14 56.6	54 43.6	1.12	15 27.3	56 36.4	2.07	16 6.7	59 1.2	2.15
2.5	15 0.5	54 58.2	1.31	15 34.2	57 2.0	2.19	16 13.6	59 26.5	2.07
3.0	15 5.2	55 15.2	1.51	15 41.5	57 29.0	2.29	16 20.2	59 50.6	1.94
3.5	15 10.3	55 34.4	1.69	15 49.2	57 57.0	2.35	16 26.2	60 12.9	1.76
4.0	15 16.2	55 55.7	1.86	15 57.0	58 25.5	2.38	16 31.6	60 32.6	1.51
4.5	15 22.5	56 19.0	2.02	16 4.7	58 53.9	2.35	16 36.1	60 49.1	1.22
5.0	15 29.3	56 44.0	2.14	16 12.3	59 21.6	2.27	16 39.5	61 1.9	0.90
5.5	15 36.5	57 10.3	2.24	16 19.4	59 48.0	2.12	16 41.9	61 10.4	0.53
6.0	15 43.9	57 37.7	2.30	16 26.1	60 12.5	1.93	16 42.9	61 14.3	+0.13
6.5	15 51.5	58 5.5	2.33	16 32.0	60 34.1	1.66	16 42.7	61 13.4	−0.28
7.0	15 59.0	58 33.3	2.30	16 36.9	60 52.2	1.35	16 41.1	61 7.6	0.68
7.5	16 6.5	59 0.5	2.21	16 40.8	61 6.4	1.00	16 38.3	60 57.2	1.05
8.0	16 13.5	59 26.2	2.07	16 43.4	61 16.1	0.61	16 34.2	60 42.3	1.40
8.5	16 20.0	59 50.0	1.88	16 45.0	61 21.9	+0.20	16 29.1	60 23.5	1.70
9.0	16 25.7	60 11.2	1.63	16 44.7	61 20.7	−0.22	16 23.0	60 1.3	1.96
9.5	16 30.6	60 29.0	1.33	16 43.3	61 15.5	0.63	16 16.3	59 36.4	2.15
10.0	16 34.5	60 43.2	1.01	16 40.5	61 5.6	1.01	16 9.0	59 9.6	2.28
10.5	16 37.2	60 53.1	0.65	16 36.7	60 51.3	1.36	16 1.3	58 41.6	2.36
11.0	16 38.7	60 58.7	+0.28	16 31.7	60 33.1	1.66	15 53.5	58 12.8	2.39
11.5	16 39.0	60 59.8	−0.09	16 25.9	60 11.6	1.91	15 45.7	57 44.1	2.36
12.0	16 38.1	60 56.5	0.46	16 19.3	59 47.5	2.09	15 38.0	57 16.1	2.29
12.5	16 36.0	60 49.0	0.79	16 12.2	59 21.5	2.22	15 30.7	56 49.2	2.18
13.0	16 32.9	60 37.5	1.10	16 4.8	58 54.3	2.29	15 23.8	56 23.7	2.06
13.5	16 28.8	60 22.6	1.37	15 57.3	58 26.7	2.31	15 17.3	56 0.0	1.89
14.0	16 24.0	60 4.9	1.58	15 49.8	57 59.2	2.28	15 11.4	55 38.3	1.72
14.5	16 18.6	59 44.9	1.75	15 42.2	57 31.1	2.22	15 6.1	55 18.7	1.54
15.0	16 12.7	59 23.1	1.87	15 35.3	57 5.9	2.13	15 1.4	55 1.4	1.35
15.5	16 6.4	59 0.2	1.94	15 28.5	56 41.1	2.01	14 57.3	54 46.4	1.16
16.0	16 0.0	58 36.7	1.97	15 22.2	56 17.8	1.87	14 53.9	54 33.7	0.97
16.5	15 53.6	58 13.1	1.97	15 16.3	55 56.3	1.72	14 51.0	54 23.2	0.78
17.0	15 47.2	57 49.6	1.93	15 10.7	55 35.6	1.56	14 48.7	54 14.9	0.60
17.5	15 41.0	57 26.8	1.87	15 6.1	55 18.8	1.41	14 47.1	54 8.8	0.42
18.0	15 35.0	57 4.9	1.79	15 1.8	55 2.8	1.25	14 46.0	54 4.8	0.25
18.5	15 29.3	56 44.0	1.70	14 58.0	54 48.8	1.09	14 45.4	54 2.7	−0.10
19.0	15 23.9	56 24.2	1.60	14 54.6	54 36.6	0.94	14 45.4	54 2.5	+0.05
19.5	15 18.8	56 5.6	1.49	14 51.9	54 26.3	0.79	14 45.7	54 3.9	0.17
20.0	15 14.2	55 48.3	1.39	14 49.5	54 17.7	0.64	14 46.5	54 6.8	0.30
20.5	15 9.8	55 32.3	1.28	14 47.6	54 10.9	0.50	14 47.7	54 11.1	0.42
21.0	15 5.8	55 17.7	1.16	14 46.2	54 5.5	0.37	14 49.3	54 16.8	0.52
21.5	15 2.2	55 4.4	1.06	14 45.2	54 1.8	0.25	14 51.1	54 23.6	0.62
22.0	14 58.9	54 52.3	0.95	14 44.6	53 59.6	0.13	14 53.3	54 31.5	0.71
22.5	14 56.0	54 41.6	0.84	14 44.3	53 58.7	−0.02	14 55.7	54 40.5	0.79
23.0	14 53.4	54 32.1	0.74	14 44.4	53 59.0	+0.09	14 58.4	54 50.5	0.87
23.5	14 51.2	54 23.8	0.65	14 44.9	54 0.8	0.20	15 1.4	55 1.4	0.95
24.0	14 49.2	54 16.6	0.55	14 45.7	54 3.7	0.30	15 4.6	55 13.3	1.02
24.5	14 47.6	54 10.7	0.44	14 46.9	54 8.0	0.41	15 8.1	55 26.0	1.10
25.0	14 46.3	54 6.0	0.34	14 48.4	54 13.6	0.52	15 11.8	55 39.7	1.18
25.5	14 45.4	54 2.6	0.23	14 50.3	54 20.5	0.64	15 15.8	55 54.3	1.25
26.0	14 44.8	54 0.4	−0.12	14 52.6	54 28.8	0.76	15 20.0	56 9.8	1.33
26.5	14 44.6	53 59.7	0.00	14 55.2	54 38.7	0.88	15 24.5	56 26.2	1.41
27.0	14 44.8	54 0.4	+0.13	14 58.3	54 50.1	1.01	15 29.2	56 43.5	1.48
27.5	14 45.4	54 2.8	0.26	15 1.9	55 3.1	1.15	15 34.2	57 1.7	1.54
28.0	14 46.5	54 6.8	0.41	15 5.8	55 17.7	1.28	15 39.3	57 20.6	1.60
28.5	14 48.1	54 12.6	0.57	15 10.2	55 33.9	1.42	15 44.6	57 40.2	1.65
29.0	14 50.3	54 20.4	0.73	15 15.1	55 51.8	1.56	15 49.5	57 58.3	1.69
29.5	14 52.9	54 30.1	0.90	15 20.4	56 11.2	1.69	15 55.6	58 20.7	1.71
30.0	14 56.1	54 41.9	1.07	15 26.1	56 32.3	1.81	16 1.3	58 41.3	1.70
30.5	14 59.9	54 55.8	1.25	15 32.3	56 54.8	1.93	16 6.8	59 1.6	+1.66
31.0	15 4.2	55 11.8	1.43	15 38.8	57 18.7	2.03	16 12.1	$\Delta s = .272 \Delta \pi$	
31.5	15 9.2	55 30.0	+1.60	15 45.5	57 43.6	+2.10	16 17.1		

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.			NOVEMBER.			DECEMBER.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d 1.0	16′ 12″.1	59′ 21″.1	+1″.59	16′ 19″.3	59′ 47″.3	+0″.15	15′ 59″.8	58′ 36″.1	−0″.81
1.5	16 17.1	59 39.6	1.48	16 19.4	59 47.8	−0.06	15 57.0	58 25.7	0.92
2.0	16 21.7	59 56.4	1.33	16 18.8	59 45.8	0.28	15 53.8	58 13.9	1.04
2.5	16 25.7	60 11.2	1.13	16 17.5	59 41.0	0.51	15 50.2	58 0.7	1.15
3.0	16 29.0	60 23.4	0.89	16 15.4	59 33.4	0.75	15 46.3	57 46.3	1.26
3.5	16 31.5	60 32.5	0.62	16 12.6	59 23.0	0.98	15 42.0	57 30.7	1.34
4.0	16 33.1	60 38.1	+0.31	16 9.0	59 10.0	1.20	15 37.6	57 14.2	1.41
4.5	16 33.6	60 39.9	−0.01	16 4.8	58 54.3	1.40	15 32.9	56 57.0	1.46
5.0	16 33.0	60 37.8	0.35	16 0.0	58 36.5	1.56	15 28.0	56 39.3	1.49
5.5	16 31.3	60 31.5	0.68	15 54.6	58 16.9	1.70	15 23.1	56 21.3	1.50
6.0	16 28.5	60 21.4	1.01	15 48.9	57 55.8	1.81	15 18.3	56 3.4	1.48
6.5	16 24.7	60 7.4	1.31	15 42.8	57 33.6	1.88	15 13.5	55 45.9	1.43
7.0	16 20.0	59 50.0	1.59	15 36.6	57 10.8	1.91	15 8.9	55 29.1	1.36
7.5	16 14.4	59 29.5	1.82	15 30.4	56 48.0	1.89	15 4.7	55 13.4	1.26
8.0	16 8.1	59 6.5	2.00	15 24.3	56 25.6	1.84	15 0.7	54 59.0	1.14
8.5	16 1.3	58 41.6	2.13	15 18.4	56 4.0	1.76	14 57.3	54 46.1	1.00
9.0	15 54.2	58 15.5	2.21	15 12.9	55 43.7	1.64	14 54.3	54 35.2	0.83
9.5	15 46.9	57 48.7	2.24	15 7.8	55 24.8	1.50	14 51.8	54 26.2	0.65
10.0	15 39.7	57 22.0	2.22	15 3.1	55 7.7	1.34	14 50.0	54 19.5	0.46
10.5	15 32.5	56 55.6	2.16	14 59.0	54 52.7	1.16	14 48.8	54 15.1	0.28
11.0	15 25.6	56 30.3	2.06	14 55.6	54 40.1	0.96	14 48.3	54 13.3	−0.05
11.5	15 19.0	56 6.4	1.93	14 52.8	54 29.8	0.75	14 48.5	54 14.1	+0.17
12.0	15 13.0	55 44.2	1.76	14 50.7	54 22.2	0.53	14 49.4	54 17.5	0.39
12.5	15 7.6	55 24.1	1.58	14 49.4	54 17.2	0.31	14 51.1	54 23.5	0.62
13.0	15 2.7	55 6.2	1.39	14 48.7	54 14.7	−0.10	14 53.5	54 32.2	0.83
13.5	14 58.5	54 50.6	1.19	14 48.7	54 14.8	+0.12	14 56.6	54 43.5	1.04
14.0	14 54.9	54 37.5	0.99	14 49.4	54 17.5	0.33	15 0.2	54 57.1	1.23
14.5	14 52.0	54 27.0	0.78	14 50.9	54 22.7	0.53	15 4.6	55 13.1	1.42
15.0	14 49.8	54 18.9	0.57	14 52.9	54 30.2	0.72	15 9.4	55 31.0	1.57
15.5	14 48.3	54 13.3	0.36	14 55.6	54 40.0	0.90	15 14.8	55 50.7	1.71
16.0	14 47.4	54 10.1	−0.16	14 58.8	54 51.8	1.05	15 20.6	56 11.9	1.82
16.5	14 47.2	54 9.3	+0.03	15 2.5	55 5.3	1.19	15 26.7	56 34.3	1.90
17.0	14 47.6	54 10.8	0.21	15 6.5	55 20.3	1.31	15 33.0	56 57.4	1.94
17.5	14 48.6	54 14.4	0.38	15 11.0	55 36.6	1.40	15 39.3	57 20.7	1.94
18.0	14 50.1	54 19.8	0.53	15 15.7	55 53.9	1.47	15 45.6	57 43.7	1.90
18.5	14 52.0	54 27.0	0.67	15 20.5	56 11.7	1.51	15 51.6	58 6.0	1.82
19.0	14 54.4	54 35.7	0.79	15 25.5	56 29.9	1.52	15 57.4	58 27.2	1.70
19.5	14 57.2	54 45.9	0.89	15 30.4	56 48.1	1.51	16 2.7	58 46.7	1.55
20.0	15 0.2	54 57.1	0.98	15 35.3	57 6.0	1.47	16 7.5	59 4.2	1.36
20.5	15 3.6	55 9.3	1.05	15 40.0	57 23.2	1.40	16 11.6	59 19.4	1.16
21.0	15 7.1	55 22.3	1.11	15 44.4	57 39.6	1.33	16 15.0	59 31.7	0.92
21.5	15 10.8	55 35.9	1.15	15 48.6	57 54.9	1.23	16 17.6	59 41.2	0.67
22.0	15 14.6	55 50.0	1.19	15 52.5	58 9.1	1.12	16 19.4	59 47.8	0.42
22.5	15 18.5	56 4.3	1.20	15 56.0	58 21.8	1.00	16 20.4	59 51.4	+0.18
23.0	15 22.5	56 18.8	1.21	15 59.0	58 33.0	0.97	16 20.6	59 52.2	−0.05
23.5	15 26.4	56 33.4	1.21	16 1.6	58 42.7	0.75	16 20.0	59 50.3	0.26
24.0	15 30.4	56 47.9	1.21	16 3.9	58 51.0	0.63	16 18.9	59 46.0	0.45
24.5	15 34.3	57 2.4	1.20	16 5.7	58 57.7	0.51	16 17.1	59 39.5	0.64
25.0	15 38.2	57 16.7	1.19	16 7.2	59 3.2	0.40	16 14.9	59 31.3	0.76
25.5	15 42.1	57 31.0	1.18	16 8.3	59 7.3	0.29	16 12.2	59 21.5	0.87
26.0	15 46.0	57 45.1	1.16	16 9.1	59 10.2	0.19	16 9.2	59 10.5	0.96
26.5	15 49.7	57 58.9	1.14	16 9.6	59 11.9	0.10	16 6.0	58 58.6	1.03
27.0	15 53.4	58 12.5	1.12	16 9.7	59 12.5	+0.01	16 2.5	58 45.9	1.08
27.5	15 57.0	58 25.7	1.09	16 9.6	59 12.1	−0.09	15 58.9	58 32.7	1.11
28.0	16 0.5	58 38.5	1.05	16 9.2	59 10.5	0.18	15 55.2	58 19.2	1.14
28.5	16 3.9	58 50.9	1.01	16 8.5	59 7.8	0.27	15 51.4	58 5.3	1.16
29.0	16 7.1	59 2.7	0.95	16 7.5	59 3.9	0.37	15 47.6	57 51.3	1.18
29.5	16 10.1	59 13.7	0.87	16 6.0	58 58.9	0.47	15 43.8	57 37.1	1.19
30.0	16 12.8	59 23.6	0.77	16 4.3	58 52.7	0.58	15 39.9	57 22.8	1.19
30.5	16 15.1	59 32.2	0.65	16 2.3	58 45.1	0.69	15 36.0	57 8.4	1.20
31.0	16 17.0	59 39.2	0.51	$\Delta s = .272 \Delta \pi$		0.81	15 32.0	56 54.0	1.21
31.5	16 18.4	59 44.3	+0.34			−0.92	15 28.1	56 39.5	−1.21

WASHINGTON MEAN TIME.

PHASES.

Month.	Last Quarter.	New Moon.	First Quarter.	Full Moon.	Last Quarter.
	d h m	d h m	d h m	d h m	d h m
January	5 21 9.0	13 20 19.8	21 22 44.9	28 15 30.7	
February	4 11 51.6	12 15 50.6	20 11 7.4	27 2 6.0	
March	6 4 52.9	14 9 45.6	21 20 1.1	28 12 40.8	
April	4 23 21.6	13 0 41.7	20 2 28.8	26 23 27.8	
May	4 18 10.5	12 12 21.2	19 7 48.3	26 10 56.9	
June	3 12 2.8	10 21 24.3	17 13 16.2	24 23 44.5	
July	3 3 53.8	10 4 57.9	16 20 4.4	24 14 11.3	
August	1 17 12.6	8 12 9.0	15 5 19.9	23 6 2.3	31 4 7.3
September		6 19 52.3	13 17 59.8	21 22 26.4	29 13 12.4
October		6 4 50.0	13 10 33.9	21 14 22.5	28 21 13.4
November		4 15 39.8	12 6 36.0	20 5 11.1	27 4 57.6
December		4 4 55.8	12 4 25.9	19 18 43.3	26 13 11.9

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Month.	Apogee.	Perigee.	Apogee.	Greatest Libration.		
	d h	d h	d h	d h m	d h m	d h m
January	14 9.8	28 9.2		6 1 52 S.W.	22 6 34 N.E.	
February	10 11.1	25 20.4		3 8 44 S.W.	19 8 41 N.E.	
March	10 0.7	25 23.5		3 16 14 S.W.	18 15 3 N.E.	31 18 17 S.W.
April	6 18.9	21 23.1			13 20 39 N.E.	28 8 44 S.W.
May	4 14.9	17 0.0			10 19 11 N.E.	25 3 3 S.W.
June	1 9.0	13 6.9	29 1.4		7 11 12 N.E.	20 11 28 S.W.
July		11 9.1	26 12.0		5 12 0 N.E.	17 20 36 S.W.
August		8 17.7	22 14.2	2 16 49 N.E.	14 20 46 S.W.	30 21 2 N.E.
September		6 3.8	18 20.0		12 1 49 S.W.	27 16 57 N.E.
October		4 11.6	16 10.1		10 6 9 S.W.	24 10 27 N.E.
November		.1 8.6	13 5.4		7 4 38 S.W.	19 17 38 N.E.
November		27 1.2				
December	11 2.7	22 21.4		4 12 26 S.W.	17 2 39 N.E.	30 18 4 S.W.

MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables:

I = the inclination to the ecliptic of the moon's equator = 1° 28′.8,

Ω = mean longitude of the moon's ascending node, (see page 248),

= mean longitude of the descending node of the moon's equator,

C = the angle at the centre of the moon's disc made by a meridian of the moon with the circle of declination, reckoned from north to east on the apparent disc,

i, Δ, Ω', and ☾ are defined on the next page, where their values for the year are given.

λ, β, a', and δ' the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

λ = the selenocentric longitude of the earth, reckoned on the moon's equator from its descending node, Ω.

$$\left.\begin{aligned} \Delta\lambda &= -0'.57 \sin 2(\Omega - \lambda) \\ a &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\lambda + a\,b \end{aligned}\right\} \text{See table, page 343.}$$

The libration in latitude $= b = B - \beta$,

" " longitude $= l = \lambda' - ☾$.

$$\sin C = \sin i \,\frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i \,\frac{\cos(a' - \Omega')}{\cos b}.$$

WASHINGTON MEAN TIME.

Mean Noon.		MOON'S EQUATOR.			☾ Moon's Mean Longitude.
		i Inclination to the Earth's Equator.	Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascend'g Node on Earth's Equator.	
		° ′	° ′	° ′	° ′
Jan.	0	22 2.4	162 59.1	1 5.2	111 31.5
	10	22 2.6	162 25.4	1 7.3	243 17.4
	20	22 2.8	161 51.7	1 9.3	15 3.2
	30	22 3.1	161 18.0	1 11.4	146 49.1
Feb.	9	22 3.4	160 44.4	1 13.5	278 34.9
	19	22 3.6	160 10.7	1 15.6	50 20.7
March	1	22 3.9	159 37.0	1 17.6	182 6.6
	11	22 4.2	159 3.3	1 19.7	313 52.4
	21	22 4.5	158 29.7	1 21.7	85 38.3
	31	22 4.8	157 56.1	1 23.7	217 24.1
April	10	22 5.1	157 22.5	1 25.7	349 9.9
	20	22 5.4	156 48.9	1 27.9	120 55.8
	30	22 5.8	156 15.3	1 29.8	252 41.6
May	10	22 6.1	155 41.7	1 31.8	24 27.4
	20	22 6.4	155 8.1	1 33.7	156 13.3
	30	22 6.8	154 34.5	1 35.7	287 59.1
June	9	22 7.2	154 0.9	1 37.7	59 45.0
	19	22 7.5	153 27.3	1 39.6	191 30.8
	29	22 7.9	152 53.7	1 41.5	323 16.6
July	9	22 8.3	152 20.1	1 43.5	95 2.5
	19	22 8.7	151 46.6	1 45.4	226 48.3
	29	22 9.1	151 13.0	1 47.3	358 34.1
Aug.	8	22 9.5	150 39.5	1 49.2	130 20.0
	18	22 9.9	150 6.0	1 51.1	262 5.8
	28	22 10.3	149 32.5	1 53.0	33 51.7
Sept.	7	22 10.7	148 59.0	1 54.9	165 37.5
	17	22 11.1	148 25.5	1 56.7	297 23.3
	27	22 11.5	147 52.1	1 58.6	69 9.2
Oct.	7	22 12.0	147 18.7	2 0.4	200 55.0
	17	22 12.4	146 45.2	2 2.2	332 40.8
	27	22 12.8	146 11.7	2 4.0	104 26.7
Nov.	6	22 13.3	145 38.3	2 5.8	236 12.5
	16	22 13.8	145 4.9	2 7.6	7 58.4
	26	22 14.3	144 31.5	2 9.3	139 44.2
Dec.	6	22 14.8	143 58.1	2 11.1	271 30.0
	16	22 15.3	143 24.7	2 12.9	43 15.9
	26	22 15.8	142 51.4	2 14.6	175 1.7
	36	22 16.3	142 18.0	2 16.3	306 47.6

Mean Solar Days.	Motion of ☾.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°.)

☊—λ	Δ λ	$\frac{1}{a}$	*B*	☊—λ	☊—λ	Δ λ	$\frac{1}{a}$	*B*	☊—λ
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					

Δ λ has the sign of tan (λ—☊)

a has the sign of cos (☊—λ)

B has the sign of sin (☊—λ)

MERCURY, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	19 52 49.63	+16.364	-22 58 0.6	+52.60	0 1 11.1	19 53 9.01	+16.380	-22 56 58.2	+52.87
1	19 59 18.94	16.071	22 36 16.4	56.05	1 1 13.7	19 59 38.65	16.082	22 35 7.5	56.32
2	20 5 40.63	15.728	22 13 11.8	59.32	2 1 16.1	20 6 0.54	15.734	22 11 56.5	59.58
3	20 11 53.45	15.331	21 48 51.0	62.38	3 1 18.3	20 12 13.44	15.331	21 47 29.5	62.63
4	20 17 56.02	14.872	21 23 19.9	65.17	4 1 20.4	20 18 15.93	14.865	21 21 52.5	65.41
5	20 23 46.75	14.343	20 56 45.4	67.65	5 1 22.3	20 24 6.41	14.328	20 55 12.5	67.86
6	20 29 23.87	13.736	20 29 15.9	69.74	6 1 24.0	20 29 43.07	13.713	20 27 38.2	69.92
7	20 34 45.39	13.042	20 1 1.6	71.38	7 1 25.4	20 35 3.91	13.009	19 59 20.0	71.52
8	20 39 49.11	12.251	19 32 14.1	72.48	8 1 26.5	20 40 6.72	12.208	19 30 29.7	72.57
9	20 44 32.57	11.353	19 3 7.4	72.97	9 1 27.2	20 44 49.03	11.300	19 1 21.3	73.01
10	20 48 53.12	10.340	18 33 57.1	72.77	10 1 27.6	20 49 8.17	10.276	18 32 10.8	72.74
11	20 52 47.88	9.202	18 5 0.8	71.79	11 1 27.6	20 53 1.26	9.127	18 3 16.2	71.69
12	20 56 13.78	7.934	17 36 38.2	69.94	12 1 27.0	20 56 25.23	7.849	17 34 56.9	69.76
13	20 59 7.65	6.533	17 9 11.1	67.15	13 1 25.9	20 59 16.95	6.439	17 7 35.0	66.89
14	21 1 26.30	5.000	16 43 2.8	63.37	14 1 24.2	21 1 33.26	4.900	16 41 34.0	63.03
15	21 3 6.68	3.343	16 18 37.6	58.56	15 1 21.9	21 3 11.18	3.240	16 17 17.8	58.15
16	21 4 5.88	+ 1.574	15 56 19.7	52.75	16 1 18.9	21 4 7.89	+ 1.472	15 55 10.5	52.29
17	21 4 21.55	- 0.281	15 36 33.1	45.98	17 1 15.2	21 4 21.14	- 0.378	15 35 35.6	45.48
18	21 3 51.98	2.189	15 19 39.8	38.33	18 1 10.8	21 3 49.35	2.275	15 18 54.8	37.81
19	21 2 36.43	4.106	15 5 59.0	29.97	19 1 5.6	21 2 31.89	4.176	15 5 26.4	29.47
20	21 0 35.27	5.978	14 55 45.2	21.11	20 0 59.6	21 0 29.29	6.027	14 55 24.4	20.65
21	20 57 50.32	7.744	14 49 7.5	12.01	21 0 53.0	20 57 43.46	7.768	14 48 57.1	11.62
22	20 54 24.93	9.338	14 46 8.3	+ 2.96	22 0 45.6	20 54 17.82	9.336	14 46 6.2	+ 2.66
23	20 50 24.01	10.694	14 46 42.7	- 5.74	23 0 37.6	20 50 17.29	10.666	14 46 46.4	- 5.93
24	20 45 53.97	11.755	14 50 38.9	13.80	24 0 29.2	20 45 48.23	11.704	14 50 45.6	13.88
25	20 41 2.45	12.477	14 57 38.1	21.00	25 0 20.5	20 40 58.19	12.409	14 57 45.3	20.97
26	20 35 57.96	12.833	15 7 17.1	27.08	26 0 11.5	20 35 55.49	12.755	15 7 22.3	26.96
27	20 30 49.31	12.824	15 19 8.7	32.01	27 0 2.5	20 30 48.78	12.744	15 19 10.0	31.82
					27 23 53.5	20 25 46.56	12.386	15 32 40.4	35.52
28	20 25 45.22	12.461	15 32 44.2	35.75	28 23 44.8	20 20 56.70	11.721	15 47 25.6	38.08
29	20 20 53.71	11.782	15 47 35.3	38.33	29 23 36.3	20 16 26.08	10.792	16 2 59.6	39.60
30	20 16 21.81	10.836	16 3 15.3	39.84	30 23 28.3	20 12 20.37	9.658	16 18 58.8	40.20
31	20 12 15.25	9.683	16 19 20.1	40.42	31 23 20.8	20 8 43.83	8.369	16 35 2.9	40.02
Feb. 1	20 8 38.34	8.374	16 35 29.1	40.21	1 23 13.8	20 5 39.45	6.983	16 50 54.6	39.21
2	20 5 34.07	6.970	16 51 25.1	39.36	2 23 7.4	20 3 9.04	5.547	17 6 20.6	37.87
3	20 3 4.17	5.518	17 6 54.0	37.97	3 23 1.5	20 1 13.26	4.101	17 21 8.8	36.09
4	20 1 9.28	4.058	17 21 44.1	36.15	4 22 56.2	19 59 52.00	2.676	17 35 10.4	34.00
5	19 59 49.18	2.623	17 35 46.6	34.02	5 22 51.5	19 59 4.45	- 1.295	17 48 18.5	31.64
6	19 59 3.01	- 1.235	17 48 54.7	31.62	6 22 47.3	19 58 49.30	+ 0.023	18 0 27.5	29.08
7	19 58 49.37	+ 0.088	18 1 2.7	29.02	7 22 43.7	19 59 4.96	1.270	18 11 32.9	26.35
8	19 59 6.62	1.337	18 12 6.4	26.27	8 22 40.5	19 59 49.61	2.438	18 21 31.4	23.50
9	19 59 52.89	2.505	18 22 2.5	23.39	9 22 37.7	20 1 1.34	3.526	18 30 20.1	20.55
10	20 1 6.22	3.592	18 30 48.2	20.41	10 22 35.4	20 2 38.21	4.535	18 37 57.1	17.52
11	20 2 44.65	4.598	18 38 21.6	17.36	11 22 33.5	20 4 38.35	5.464	18 44 20.2	14.41
12	20 4 46.27	5.524	18 44 40.8	14.24	12 22 31.9	20 6 59.89	6.320	18 49 28.3	11.26
13	20 7 9.22	6.376	18 49 44.7	11.08	13 22 30.6	20 9 41.13	7.106	18 53 20.4	8.07
14	20 9 51.76	7.158	18 53 32.2	7.88	14 22 29.7	20 12 40.43	7.824	18 55 55.4	4.84
15	20 12 52.25	7.872	18 56 2.5	4.64	15 22 29.0	20 15 56.26	8.484	18 57 12.5	- 1.58
16	20 16 9.15	8.527	18 57 14.7	- 1.37	16 22 28.6	20 19 27.21	9.087	18 57 11.0	+ 1.70
17	20 19 41.09	9.125	18 57 8.2	+ 1.91	17 22 28.4	20 23 12.01	9.638	18 55 50.7	4.99
18	20 23 26.76	9.672	18 55 42.9	5.20	18 22 28.4	20 27 9.49	10.144	18 53 11.4	8.29
19	20 27 24.99	10.173	18 52 58.5	8.50	19 22 28.6	20 31 18.56	10.604	18 49 12.5	11.61
20	20 31 34.72	10.630	18 48 54.6	11.82	20 22 29.0	20 35 38.20	11.026	18 43 53.8	14.95
21	20 35 54.93	11.048	18 43 30.9	15.15	21 22 29.6	20 40 7.55	11.414	18 37 15.2	18.27
22	20 40 24.76	11.432	18 36 47.5	18.47	22 22 30.3	20 44 45.80	11.768	18 29 16.8	21.60
23	20 45 3.40	11.783	18 28 44.3	21.80	23 22 31.1	20 49 32.19	12.093	18 19 58.4	24.93
24	20 49 50.11	12.105	18 19 21.3	25.12	24 22 32.1	20 54 26.07	12.393	18 9 20.0	28.27
25	20 54 44.24	12.402	18 8 38.4	28.45	25 22 33.1	20 59 26.84	12.668	17 57 21.7	31.60
26	20 59 45.19	12.674	17 56 35.8	31.77	26 22 34.3	21 4 33.97	12.922	17 44 3.6	34.91
27	21 4 52.43	12.925	17 43 13.6	35.08	27 22 35.5	21 9 46.93	13.155	17 29 26.0	38.22
28	21 10 5.44	13.156	17 28 32.1	38.38	28 22 36.9	21 15 5.29	13.372	17 13 28.9	41.53
29	21 15 23.80	+13.371	-17 12 31.3	+41.68	29 22 38.3	21 20 28.66	+13.573	-16 56 12.5	+44.83

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	21 15 23.80	+13.371	-17 12 31.3	+ 41.68	1 22 38.3	21 20 28.66	+13.573	-16 56 12.5	+ 44.83
2	21 50 47.12	13.570	16 55 11.4	44.97	2 22 39.9	21 25 56.67	13.760	16 37 36.9	48.12
3	21 26 15.03	13.755	16 36 32.6	48.25	3 22 41.5	21 31 29.02	13.934	16 17 42.6	51.40
4	21 31 47.24	13.927	16 16 35.3	51.52	4 22 43.1	21 37 5.41	14.096	15 56 29.8	54.67
5	21 37 23.45	14.088	15 55 19.7	54.78	5 22 44.8	21 42 45.59	14 250	15 33 58.6	57.92
6	21 43 3.41	14.240	15 32 46.0	58.02	6 22 46.6	21 48 29.32	14.394	15 10 9.4	61.16
7	21 48 46.91	14.383	15 8 54.6	61.25	7 22 48.5	21 54 16.43	14.532	14 45 2.7	64.39
8	21 54 33.75	14.520	14 43 45.9	64.47	8 22 50.4	22 0 6.79	14.662	14 18 38.7	67.60
9	22 0 23.80	14.649	14 17 20.2	67.67	9 22 52.3	22 6 0.21	14.788	13 50 57.7	70.81
10	22 6 16.88	14.774	13 49 37.8	70.86	10 22 54.3	22 11 56.61	14.910	13 22 0.1	73.99
11	22 12 12.92	14.895	13 20 39.1	74.03	11 22 56.3	22 17 55.87	15.028	12 51 46.3	77.15
12	22 18 11.80	15.012	12 50 24.5	77.18	12 22 58.4	22 23 57.95	15.144	12 20 16.8	80.30
13	22 24 13.47	15.127	12 18 54.5	80.32	13 23 0.5	22 30 2.77	15.258	11 47 32.1	83.43
14	22 30 17.87	15.240	11 46 9.5	83.43	14 23 2.7	22 36 10.32	15.372	11 13 32.4	86.54
15	22 36 24.98	15.353	11 12 9.9	86.53	15 23 4.9	22 42 20.61	15.486	10 38 18.4	89.63
16	22 42 34.80	15.466	10 36 56.3	89.61	16 23 7.2	22 48 33.63	15.600	10 1 50.4	92.69
17	22 48 47.34	15.579	10 0 29.0	92.66	17 23 9.5	22 54 49.42	15.715	9 24 9.2	95.74
18	22 55 2.62	15.694	9 22 48.8	95.69	18 23 11.9	23 1 8.01	15.834	8 45 15.1	98.75
19	23 1 20.69	15.812	8 43 56.1	98.69	19 23 14.3	23 7 29.48	15.955	8 5 9.1	101.75
20	23 7 41.61	15.932	8 3 51.7	101.67	20 23 16.7	23 13 53.90	16.081	7 24 51.5	104.71
21	23 14 5.47	16.057	7 22 36.1	104.62	21 23 19.2	23 20 21.37	16.210	6 41 23.3	107.64
22	23 20 32.36	16.185	6 40 10.3	107.53	22 23 21.8	23 26 52.00	16.344	5 57 45.3	110.52
23	23 27 2.39	16.318	5 56 35.1	110.40	23 23 24.4	23 33 25.90	16.482	5 12 58.6	113.36
24	23 33 35.65	16.455	5 11 51.5	113.22	24 23 27.1	23 40 3.19	16.627	4 27 4.4	116.15
25	23 40 12.29	16.599	4 26 0.8	116.00	25 23 29.8	23 46 44.03	16.777	3 40 3.9	118.88
26	23 46 52.45	16.748	3 39 4.2	118.71	26 23 32.6	23 53 28.55	16.933	2 51 58.8	121.54
27	23 53 36.26	16.903	2 51 3.4	121.35	27 23 35.5	0 0 16.89	17.095	2 2 50.8	124.12
28	0 0 23.86	17.064	2 2 0.2	123.91	28 23 38.4	0 7 9.19	17.264	1 12 42.2	126.59
29	0 7 15.39	17.231	1 11 56.7	126.37	29 23 41.4	0 14 5.58	17.437	- 0 21 35.4	128.95
30	0 14 10.98	17.403	- 0 20 55.5	128.71	30 23 44.5	0 21 6.20	17.615	+ 0 30 26.5	131.16
31	0 21 10.76	17.579	+ 0 31 0.4	130.92	31 23 47.6	0 28 11.13	17.798	1 23 20.2	133.27
Apr. 1	0 28 14.81	17.760	1 23 47.7	132.99	1 23 50.8	0 35 20.49	17.982	2 17 1.7	135.15
2	0 35 23.24	17.943	2 17 22.4	134.86	2 23 54.1	0 42 34.28	18.168	3 11 26.1	136.84
3	0 42 36.07	18.127	3 11 39.6	136.53	3 23 57.4	0 49 52.50	18.352	4 6 28.2	138.29
4	0 49 53.29	18 309	4 6 34.1	137.97					
5	0 57 14.86	18.488	5 1 59.8	139.13	5 0 0.8	0 57 15.12	18.533	5 2 1.8	139.46
6	1 4 40.64	18.660	5 57 49.6	139.96	6 0 4.3	1 4 41.99	18.706	5 57 59.7	140.30
7	1 12 10.44	18 822	6 53 55.2	140.45	7 0 7.9	1 12 12.92	18.870	6 54 13.7	140.80
8	1 19 43.96	18.969	7 50 7.9	140.54	8 0 11.5	1 19 47.60	19.018	7 50 34 9	140.89
9	1 27 20.80	19.098	8 46 17.9	140.21	9 0 15.2	1 27 25.64	19.148	8 46 53.4	140.56
10	1 35 0.48	19.204	9 42 14.5	139.42	10 0 18.9	1 35 6.55	19.255	9 42 58.5	139.77
11	1 42 42.36	19.281	10 37 46.2	138.13	11 0 22.7	1 42 49.66	19.332	10 38 38.5	138.47
12	1 50 25.71	19.326	11 32 40.4	136.30	12 0 26.5	1 50 34.24	19.377	11 33 40.6	136.62
13	1 58 9.69	19.332	12 26 44.4	133.95	13 0 30.3	1 58 19.45	19.382	12 27 52.0	134.25
14	2 5 53.32	19.296	13 19 45.6	131.06	14 0 34.1	2 6 4.28	19.345	13 21 0.0	131.33
15	2 13 35.55	19.215	14 11 31.0	127.63	15 0 37.8	2 13 47.67	19.262	14 12 51 5	127.87
16	2 21 15.26	19.086	15 1 47.8	123.69	16 0 41.6	2 21 28.48	19.130	15 3 13.5	123.89
17	2 28 51.26	18.905	15 50 24.3	119.27	17 0 45.2	2 29 5.51	18.946	15 51 54.1	119.42
18	2 36 22.31	18.674	16 37 9.3	114.41	18 0 48.8	2 36 37.50	18.711	16 38 42.3	114.52
19	2 43 47.22	18.392	17 21 52.9	109.17	19 0 52.3	2 44 3.24	18.424	17 23 27.9	109.23
20	2 51 4.73	18.059	18 4 26.7	103.60	20 0 55.6	2 51 21.47	18.086	18 6 2.7	103.62
21	2 58 13.66	17.678	18 44 43.5	97.76	21 0 58.8	2 58 30.99	17.700	18 46 19.3	97.73
22	3 5 12.88	17.250	19 22 37.5	91.71	22 1 1.9	3 5 30.67	17.266	19 24 12.0	91.63
23	3 12 1.33	16.779	19 58 4.5	85.52	23 1 4.8	3 12 19.43	16.789	19 59 36.7	85.40
24	3 18 37.96	16.267	20 31 1.7	79.23	24 1 7.4	3 18 56.23	16.271	20 32 30.5	79.08
25	3 25 1.83	15.716	21 1 27.3	72.90	25 1 9.9	3 25 20.11	15.714	21 2 52.0	72.71
26	3 31 12.06	15.130	21 29 20.8	66.57	26 1 12.1	3 31 30.22	15.122	21 30 40.6	66.35
27	3 37 7.81	14.511	21 54 42.7	60.26	27 1 14.1	3 37 25.71	14.497	21 55 56.9	60.01
28	3 42 48.34	13.861	22 17 33.8	54.01	28 1 15.8	3 43 5.83	13.841	22 18 41.8	53.74
29	3 48 12.91	13.182	22 37 56.0	47.85	29 1 17.2	3 48 29.86	13.157	22 38 57.4	47.57
30	3 53 20.88	12.477	22 55 51.6	41.80	30 1 18.4	3 53 37.15	12.447	22 56 46.0	41.51
31	3 58 11.60	+11.746	+23 11 23.2	+ 35.85	31 1 19.3	3 58 27.09	+11.711	+23 12 10.4	+ 35.55

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	3 58 11.60	+11.746	+23 11 23.2	+35.85	1 1 19.3	3 58 27.09	+11.711	+23 12 10.4	+35.55
2	4 2 44.48	10.991	23 24 33.4	30.02	2 1 19.9	4 2 50.08	10.952	23 25 13.2	29.71
3	4 6 58.97	10.214	23 35 25.2	24.31	3 1 20.2	4 7 12.59	10.171	23 35 57.5	24.00
4	4 10 54.56	9.415	23 44 1.4	18.73	4 1 20.2	4 11 7.11	9.369	23 44 26.2	18.42
5	4 14 30.74	8.597	23 50 25.1	13.27	5 1 19.8	4 14 42.14	8.548	23 50 42.6	12.97
6	4 17 47.08	7.762	23 54 39.3	7.94	6 1 19.1	4 17 57.28	7.711	23 54 49.6	7.65
7	4 20 43.18	6.911	23 56 46.9	+ 2.72	7 1 18.1	4 20 52.15	6.859	23 56 50.2	+ 2.44
8	4 23 18.71	6.047	23 56 50.7	− 2.38	8 1 16.7	4 23 26.41	5.994	23 56 47.5	− 2.64
9	4 25 33.37	5.173	23 54 53.6	7.36	9 1 15.0	4 25 39.80	5.121	23 54 44.2	7.60
10	4 27 26.97	4.293	23 50 58.3	12.22	10 1 12.9	4 27 32.16	4.242	23 50 43.2	12.44
11	4 28 59.41	3.410	23 45 7.8	16.96	11 1 10.5	4 29 3.39	3.361	23 44 47.8	17.16
12	4 30 10.65	2.529	23 37 25.3	21.56	12 1 7.7	4 30 13.49	2.483	23 37 0.9	21.73
13	4 31 0.87	1.658	23 27 54.0	26.02	13 1 4.6	4 31 2.63	1.615	23 27 25.9	26.16
14	4 31 30·35	+ 0.801	23 16 37.7	30.31	14 1 1.2	4 31 31.14	+ 0.763	23 16 6.7	30.41
15	4 31 39.50	− 0.034	23 3 40.6	34.42	15 0 57.4	4 31 39.45	− 0.066	23 3 7.6	34.48
16	4 31 28.97	0.838	22 49 7.4	38.31	16 0 53.3	4 31 28.22	0.864	22 48 33.3	38.34
17	4 30 59.57	1.604	22 33 3.8	41.95	17 0 48.8	4 30 58.26	1.624	22 32 29.7	41.93
18	4 30 12.34	2.322	22 15 36.4	45.29	18 0 44.1	4 30 10.62	2.336	22 15 3.1	45.24
19	4 29 8.55	2.984	21 56 52.7	48.30	19 0 39.1	4 29 6.59	2.991	21 56 21.2	48.20
20	4 27 49.65	3.580	21 37 1.3	50.92	20 0 33.9	4 27 47.63	3.580	21 36 32.6	50.79
21	4 26 17.28	4.103	21 16 12.2	53.10	21 0 28.4	4 26 15.34	4.097	21 15 47.1	52.94
22	4 24 33.36	4.542	20 54 36.5	54.79	22 0 22.7	4 24 31.64	4.531	20 54 15.7	54.60
23	4 22 39.91	4.895	20 32 26.5	55.95	23 0 16.9	4 22 38.53	4.879	20 32 10.7	55.73
24	4 20 39.14	5.153	20 9 55.6	56.53	24 0 11.0	4 20 38.19	5.133	20 9 45.2	56.30
25	4 18 33.31	5.316	19 47 18.0	56.50	25 0 5.0	4 18 32.87	5.294	19 47 13.3	56.26
					25 23 58.9	4 16 24.84	5.358	19 24 49.3	55.64
26	4 16 24.74	5.381	19 24 48.3	55.87	26 23 52.9	4 14 16.43	5.327	19 2 47.8	54.38
27	4 14 15.79	5.349	19 2 41.3	54.60	27 23 46.9	4 12 9.89	5.202	18 41 23.8	52.52
28	4 12 8.74	5.222	18 41 12.2	52.72	28 23 40.9	4 10 7.45	4.987	18 20 51.4	50.07
29	4 10 5.85	5.004	18 20 35.4	50.24	29 23 35.0	4 8 11.18	4.689	18 1 24.7	47.08
30	4 8 9.22	4.702	18 1 5.0	47.21	30 23 29.3	4 6 23.01	4.312	17 43 15.8	43.59
31	4 6 20.80	4.320	17 42 53.4	43.68	31 23 23.7	4 4 44.75	3.867	17 26 36.2	39.65
June 1	4 4 42.41	3.869	17 26 12.2	39.69	1 23 18.3	4 3 17.91	3.360	17 11 35.7	35.33
2	4 3 15.58	3.357	17 11 11.2	35.33	2 23 13.2	4 2 3.91	2.800	16 58 22.9	30.71
3	4 2 1.72	2.791	16 57 58.9	30.66	3 23 8.3	4 1 3.88	2.195	16 47 3.8	25.84
4	4 1 1.99	2.180	16 46 41.5	25.75	4 23 3.6	4 0 18.82	1.554	16 37 43.8	20.80
5	4 0 17.37	1.533	16 37 24.3	20.67	5 22 59.2	3 59 49.53	0.883	16 30 26.1	15.65
6	3 59 48.65	0.857	16 30 10.3	15.48	6 22 55.0	3 59 36.63	− 0.189	16 25 12.5	10.49
7	3 59 36.44	− 0.157	16 25 1.3	10.28	7 22 51.1	3 59 40.60	+ 0.522	16 22 3.1	5.30
8	3 59 41.22	+ 0.558	16 21 57.2	− 5.07	8 22 47.6	4 0 1.76	1.243	16 20 57.5	− 0.19
9	4 0 3.29	1.283	16 20 57.4	+ 0.06	9 22 44.3	4 0 40.33	1.973	16 21 53.0	+ 4.80
10	4 0 42.86	2.016	16 21 59.2	5.07	10 22 41.3	4 1 36.48	2.706	16 24 46.8	9.66
11	4 1 40.07	2.752	16 24 59.6	9.94	11 22 38.6	4 2 50.23	3.440	16 29 35.1	14.35
12	4 2 54.94	3.488	16 29 54.8	14.63	12 22 36.2	4 4 21.59	4.173	16 36 13.7	18.83
13	4 4 27.46	4.222	16 36 40.2	19.11	13 22 34.0	4 6 10.52	4.904	16 44 36.9	23.06
14	4 6 17.59	4.954	16 45 10.1	23.34	14 22 32.2	4 8 16.95	5.631	16 54 38.7	27.05
15	4 8 25.23	5.682	16 55 18.5	27.32	15 22 30.7	4 10 40.78	6.354	17 6 13.5	30.80
16	4 10 50.28	6.405	17 6 59.5	31.05	16 22 29.4	4 13 21.90	7.073	17 19 14.5	34.25
17	4 13 32.63	7.124	17 20 6.5	34.48	17 22 28.4	4 16 20.27	7.790	17 33 35.1	37.42
18	4 16 32.21	7.840	17 34 32.4	37.63	18 22 27.7	4 19 35.79	8.503	17 49 8.3	40.30
19	4 19 48.91	8.551	17 50 10.5	40.49	19 22 27.3	4 23 8.38	9.213	18 5 47.1	42.87
20	4 23 22.65	9.260	18 6 53.4	43.03	20 22 27.2	4 26 57.98	9.921	18 23 23.4	45.11
21	4 27 13.36	9.966	18 24 33.2	45.24	21 22 27.4	4 31 4.57	10.629	18 41 49.6	47.02
22	4 31 21.02	10.672	18 43 2.2	47.12	22 22 27.9	4 35 28.15	11.337	19 0 57.8	48.60
23	4 35 45.60	11.377	19 2 12.5	48.67	23 22 28.7	4 40 8.73	12.045	19 20 39.7	49.83
24	4 40 27.11	12.082	19 21 55.6	49.86	24 22 29.7	4 45 6.30	12.753	19 40 46.5	50.69
25	4 45 25.53	12.787	19 42 2.9	50.69	25 22 30.9	4 50 20.88	13.463	20 1 9.7	51.17
26	4 50 40.88	13.493	20 2 25.6	51.14	26 22 32.4	4 55 52.50	14.173	20 21 39.6	51.26
27	4 56 13.18	14.199	20 22 54.3	51.19	27 22 34.3	5 1 41.18	14.884	20 42 6.8	50.94
28	5 2 2.43	14.905	20 43 19.4	50.83	28 22 36.5	5 7 46.91	15.593	21 2 21.0	50.17
29	5 8 8.61	15.609	21 3 30.6	50.03	29 22 38.9	5 14 9.64	16.301	21 22 11.3	48.96
30	5 14 31.66	16.311	21 23 17.3	48.79	30 22 41.6	5 20 49.30	17.003	21 41 27.2	47.29
31	5 21 11.49	+17.007	+21 42 28.8	+47.09	31 22 44.6	5 27 45.73	+17.698	+21 59 57.3	+45.12

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	5 21 11.49	+17.007	+21 42 28.8	+ 47.09	1 22 44.6	5 27 45.73	+17.698	+21 59 57.3	+ 45.12
2	5 28 7.93	17.695	22 0 53.8	44.90	2 22 47.9	5 34 58.67	18.379	22 17 29.3	42.47
3	5 35 20.73	18.369	22 18 20.1	42.22	3 22 51.4	5 42 27.76	19.043	22 33 51.4	39.29
4	5 42 49.49	19.025	22 34 36.1	39.03	4 22 55.2	5 50 12.51	19.683	22 48 51.3	35.60
5	5 50 33.72	19.657	22 49 29.5	35.33	5 22 59.2	5 58 12.30	20.294	23 2 16.6	31.42
6	5 58 32.80	20.260	23 2 48.2	31.14	6 23 3.5	6 6 26.28	20.866	23 13 55.3	26.72
7	6 6 45.88	20.824	23 14 20.3	26.45	7 23 8.0	6 14 53.50	21.394	23 23 35.7	21.55
8	6 15 11.98	21.343	23 23 54.2	21.29	8 23 12.7	6 23 32.78	21.870	23 31 6.3	15.93
9	6 23 49.95	21.812	23 31 18.8	15.69	9 23 17.6	6 32 22.77	22.285	23 36 17.4	9.93
10	6 32 38.46	22.220	23 36 24.4	9.71	10 23 22.6	6 41 21.96	22.636	23 39 0.1	+ 3.58
11	6 41 36.01	22.564	23 39 2.3	+ 3.40	11 23 27.8	6 50 28.70	22.914	23 39 7.2	− 3.03
12	6 50 40.96	22.836	23 39 5.6	− 3.17	12 23 33.0	6 59 41.23	23.117	23 36 33.3	9.83
13	6 59 51.58	23.036	23 36 28.8	9.92	13 23 38.3	7 8 57.73	23.245	23 31 14.7	16.73
14	7 9 6.09	23.161	23 31 8.6	16.77	14 23 43.7	7 18 16.40	23.297	23 23 9.9	23.66
15	7 18 22.71	23.211	23 23 3.5	23.65	15 23 49.1	7 27 35.42	23.274	23 12 19.6	30.52
16	7 27 39.65	23.188	23 12 14.0	30.46	16 23 54.4	7 36 53.04	23.182	22 58 45.9	37.25
17	7 36 65.20	23.096	22 58 42.4	37.14	17 23 59.7	7 46 7.66	23.026	22 42 33.1	43.77
18	7 46 7.78	22.942	22 42 32.9	43.61					
19	7 55 15.96	22.731	22 23 50.9	49.83	19 0 4.9	7 55 17.82	22.812	22 23 46.8	50.03
20	8 4 18.47	22.472	22 2 43.2	55.76	20 0 10.0	8 4 22.23	22.549	22 2 33.9	55.99
21	8 13 14.20	22.168	21 39 17.3	61.34	21 0 15.0	8 13 19.75	22.240	21 39 1.9	61.61
22	8 22 2.23	21.830	21 13 41.8	66.56	22 0 19.9	8 22 9.46	21.898	21 13 19.7	66.85
23	8 30 41.80	21.464	20 46 5.4	71.41	23 0 24.6	8 30 50.59	21.527	20 45 36.1	71.72
24	8 39 12.33	21.077	20 16 37.1	75.89	24 0 29.2	8 39 22.59	21.135	20 16 0.2	76.21
25	8 47 33.37	20.675	19 45 25.8	79.99	25 0 33.6	8 47 44.96	20.728	19 44 41.0	80.32
26	8 55 44.63	20.262	19 12 40.5	83.73	26 0 37.9	8 55 57.43	20.310	19 11 47.7	84.06
27	9 3 45.91	19.844	18 38 29.7	87.11	27 0 42.0	9 3 59.80	19.887	18 37 28.8	87.44
28	9 11 37.13	19.424	18 3 2.0	90.15	28 0 45.9	9 11 51.98	19.462	18 1 53.1	90.48
29	9 19 18.28	19.005	17 26 25.1	92.87	29 0 49.6	9 19 33.99	19.039	17 25 8.3	93.19
30	9 26 49.43	18.591	16 48 46.6	95.29	30 0 53.2	9 27 5.90	18.621	16 47 22.1	95.60
31	9 34 10.71	18.183	16 10 13.5	97.42	31 0 56.6	9 34 27.86	18.209	16 8 41.6	97.72
Aug. 1	9 41 22.27	17.782	15 30 52.7	99.27	1 0 59.9	9 41 40.00	17.805	15 29 13.7	99.56
2	9 48 24.30	17.389	14 50 50.4	100.88	2 1 3.0	9 48 42.53	17.408	14 49 4.6	101.16
3	9 55 17.02	17.006	14 10 12.2	102.26	3 1 5.9	9 55 35.68	17.022	14 8 19.9	102.52
4	10 2 0.65	16.632	13 29 3.8	103.41	4 1 8.7	10 2 19.67	16.646	13 27 5.5	103.65
5	10 8 35.43	16.268	12 47 30.3	104.36	5 1 11.3	10 8 54.76	16.280	12 45 26.3	104.59
6	10 15 1.60	15.914	12 5 36.2	105.11	6 1 13.8	10 15 21.17	15.923	12 3 26.9	105.32
7	10 21 19.39	15.570	11 23 26.5	105.68	7 1 16.2	10 21 39.14	15.577	11 21 12.3	105.87
8	10 27 29.03	15.235	10 41 5.1	106.08	8 1 18.4	10 27 48.92	15.240	10 38 46.5	106.26
9	10 33 30.73	14.908	9 58 36.0	106.32	9 1 20.4	10 33 50.71	14.911	9 56 13.4	106.48
10	10 39 24.71	14.592	9 16 3.0	106.41	10 1 22.4	10 39 44.74	14.593	9 13 36.9	106.55
11	10 45 11.18	14.282	8 33 29.6	106.35	11 1 24.2	10 45 31.21	14.282	8 31 0.3	106.47
12	10 50 50.28	13.978	7 50 59.2	106.16	12 1 25.9	10 51 10.29	13.976	7 48 27.1	106.27
13	10 56 22.18	13.682	7 8 35.0	105.83	13 1 27.5	10 56 42.13	13.679	7 6 0.6	105.92
14	11 1 47.04	13.391	6 26 20.3	105.38	14 1 29.0	11 2 6.89	13.386	6 23 44.0	105.45
15	11 7 4.98	13.104	5 44 18.0	104.80	15 1 30.3	11 7 24.69	13.098	5 41 40.2	104.85
16	11 12 16.07	12.821	5 2 31.0	104.10	16 1 31.6	11 12 35.62	12.814	4 59 52.1	104.13
17	11 17 20.42	12.541	4 21 2.4	103.27	17 1 32.7	11 17 39.78	12.533	4 18 22.9	103.29
18	11 22 18.06	12.262	3 39 55.0	102.33	18 1 33.7	11 22 37.20	12.252	3 37 15.3	102.33
19	11 27 9.01	11.984	2 59 11.5	101.27	19 1 34.6	11 27 27.90	11.973	2 56 32.0	101.26
20	11 31 53.28	11.705	2 18 54.9	100.09	20 1 35.4	11 32 11.88	11.692	2 16 15.9	100.06
21	11 36 30.86	11.426	1 39 8.1	98.79	21 1 36.1	11 36 49.14	11.412	1 36 30.0	98.74
22	11 41 1.68	11.142	0 59 53.8	97.37	22 1 36.7	11 41 19.61	11.127	0 57 17.1	97.30
23	11 45 25.64	10.854	+ 0 21 15.4	95.82	23 1 37.1	11 45 43.18	10.837	+ 0 18 40.5	95.74
24	11 49 42.62	10.560	− 0 16 44.2	94.12	24 1 37.4	11 49 59.74	10.542	− 0 19 16.9	94.02
25	11 53 52.46	10.258	0 54 1.5	92.29	25 1 37.6	11 54 9.13	10.238	0 56 31.6	92.17
26	11 57 54.94	9.948	1 30 33.1	90.31	26 1 37.7	11 58 11.12	9.927	1 33 0.1	90.17
27	12 1 49.85	9.626	2 6 15.6	88.19	27 1 37.7	12 2 5.50	9.603	2 8 39.1	88.03
28	12 5 36.89	9.291	2 41 5.0	85.90	28 1 37.5	12 5 51.96	9.266	2 43 24.4	85.72
29	12 9 15.71	8.941	3 14 57.2	83.42	29 1 37.2	12 9 30.17	8.915	3 17 12.2	83.23
30	12 12 45.92	8.574	3 47 47.7	80.75	30 1 36.8	12 12 59.73	8.546	3 49 57.7	80.54
31	12 16 7.09	+ 8.187	− 4 19 31.7	− 77.88	31 1 36.2	12 16 20.19	+ 8.157	− 4 21 36.3	− 77.65

MERCURY, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	12 19 18.71	+ 7.777	− 4 50 3.9	− 74.77	1 1 35.4	12 19 31.06	+ 7.744	− 4 52 2.6	− 74.51
2	12 22 20.20	7.342	5 19 18.8	71.42	2 1 34.4	12 22 31.74	7.307	5 21 11.1	71.14
3	12 25 10.93	6.880	5 47 10.0	67.80	3 1 33.4	12 25 21.62	6.843	5 48 55.3	67.50
4	12 27 50.18	6.387	6 13 30.8	63.88	4 1 32.1	12 27 59.96	6.348	6 15 8.6	63.56
5	12 30 17.22	5.860	6 38 13.8	59.65	5 1 30.6	12 30 26.03	5.819	6 39 43.6	59.31
6	12 32 31.16	5.295	7 1 10.9	55.05	6 1 28.9	12 32 38.97	5.252	7 2 32.2	54.69
7	12 34 31.08	4.691	7 22 13.1	50.07	7 1 26.9	12 34 37.84	4.647	7 23 25.4	49.69
8	12 36 15.99	4.045	7 41 11.0	44.68	8 1 24.7	12 36 21.67	3.999	7 42 13.9	44.28
9	12 37 44.87	3.354	7 57 53.8	38.82	9 1 22.2	12 37 49.43	3.307	7 58 46.8	38.40
10	12 38 56.59	2.615	8 12 10.3	32.47	10 1 19.4	12 39 0.02	2.568	8 12 53.1	32.04
11	12 39 50.01	1.829	8 23 48.3	25.60	11 1 16.4	12 39 52.31	1.782	8 24 20.7	25.17
12	12 40 24.00	0.995	8 32 34.9	18.18	12 1 13.0	12 40 25.18	0.949	8 32 56.8	17.75
13	12 40 37.41	+ 0.115	8 38 16.4	10.18	13 1 9.3	12 40 37.52	+ 0.072	8 38 27.9	9.76
14	12 40 29.20	− 0.807	8 40 38.9	− 1.60	14 1 5.2	12 40 28.30	− 0.847	8 40 40.4	− 1.20
15	12 39 58.44	1.763	8 39 28.4	+ 7.57	15 1 0.7	12 39 56.64	1.798	8 39 20.5	+ 7.94
16	12 39 4.38	2.746	8 34 31.2	17.28	16 0 55.9	12 39 1.80	2.775	8 34 14.9	17.60
17	12 37 46.56	3.741	8 25 35.1	27.46	17 0 50.7	12 37 43.39	3.762	8 25 11.7	27.72
18	12 36 4.88	4.731	8 12 30.0	38.02	18 0 45.0	12 36 1.32	4.742	8 12 1.4	38.20
19	12 33 59.72	5.693	7 55 8.3	48.81	19 0 39.0	12 33 56.01	5.694	7 54 36.5	48.89
20	12 31 32.06	6.601	7 33 27.3	59.59	20 0 32.6	12 31 28.46	6.591	7 32 54.8	59.56
21	12 28 43.53	7.427	7 7 30.0	70.11	21 0 25.9	12 28 40.33	7.405	7 6 59.7	69.96
22	12 25 36.51	8.136	6 37 26.6	80.05	22 0 18.9	12 25 33.95	8.104	6 37 1.4	79.78
23	12 22 14.22	8.694	6 3 35.3	89.03	23 0 11.6	12 22 12.54	8.654	6 3 18.1	88.64
24	12 18 40.66	9.069	5 26 23.7	96.68	24 0 4.1	12 18 40.04	9.023	5 26 17.1	96.20
					24 23 56.5	12 15 1.13	9.184	4 46 34.5	102.04
25	12 15 0.60	9.232	4 46 28.6	102.59	25 23 48.9	12 11 21.08	9.115	4 4 55.3	105.88
26	12 11 19.39	9.161	4 4 35.7	106.45	26 23 41.4	12 7 45.58	8.804	3 22 11.1	107.42
27	12 7 42.85	8.843	3 21 37.7	107.97	27 23 34.1	12 4 20.49	8.249	2 39 18.9	106.53
28	12 4 16.91	8.277	2 38 32.7	107.02	28 23 27.0	12 1 11.56	7.458	1 57 17.7	103.17
29	12 1 7.45	7.472	1 56 20.8	103.55	29 23 20.3	11 58 24.28	6.451	1 17 5.9	97.43
30	11 58 20.00	6.449	1 16 1.4	97.67	30 23 14.0	11 56 3.41	5.259	0 39 38.5	89.52
Oct. 1	11 55 59.38	5.240	0 38 30.0	89.60	1 23 8.3	11 54 13.05	3.916	− 0 5 44.1	79.71
2	11 54 9.69	3.880	− 0 4 35.7	79.63	2 23 3.1	11 52 56.34	2.461	+ 0 23 56.0	68.39
3	11 52 54.03	2.410	+ 0 25 0.4	68.15	3 22 58.5	11 52 15.45	− 0.938	0 48 49.5	55.95
4	11 52 14.52	− 0.875	0 49 46.8	55.57	4 22 54.5	11 52 11.53	+ 0.614	1 8 35.3	42.76
5	11 52 12.25	+ 0.686	1 9 21.8	42.26	5 22 51.1	11 52 44.83	2.157	1 22 59.3	29.22
6	11 52 47.36	2.235	1 23 32.6	28.62	6 22 48.3	11 53 54.75	3.661	1 31 56.9	15.60
7	11 53 59.18	3.740	1 32 15.2	14.96	7 22 46.1	11 55 39.98	5.096	1 35 30.6	+ 2.26
8	11 55 46.31	5.174	1 35 33.0	+ 1.59	8 22 44.5	11 57 58.63	6.442	1 33 49.6	− 10.58
☋ 9	11 58 6.79	6.516	1 33 35.8	− 11.25	9 22 43.4	12 0 48.41	7.687	1 27 8.0	22.76
10	12 0 58.27	7.754	1 26 38.4	23.40	10 22 42.8	12 4 6.69	8.819	1 15 43.6	34.12
11	12 4 18.08	8.878	1 14 59.3	34.71	11 22 42.6	12 7 50.75	9.834	0 59 57.6	44.57
12	12 8 3.47	9.885	0 58 59.7	45.10	12 22 42.7	12 11 57.78	10.733	0 40 12.3	54.04
13	12 12 11.62	10 775	0 39 2.4	54.51	13 22 43.2	12 16 25.06	11.521	+ 0 16 51.2	62.55
14	12 16 39.81	11.555	+ 0 15 31.0	62.94	14 22 44.0	12 21 9.96	12.204	− 0 9 42.0	70.07
15	12 21 25.42	12.229	− 0 11 10.9	70.39	15 22 45.1	12 26 10.05	12.788	0 39 4.6	76.66
16	12 26 26.02	12.805	0 40 40.4	76.91	16 22 46.4	12 31 23.05	13.284	1 10 54.2	82.33
17	12 31 39.38	13.294	1 12 35.3	82.52	17 22 47.8	12 36 47.02	13.701	1 44 49.9	87.17
18	12 37 3.50	13.705	1 46 34.8	87.30	18 22 49.4	12 42 20.13	14.048	2 20 32.4	91.24
19	12 42 36.65	14.047	2 22 19.7	91.31	19 22 51.2	12 48 0.82	14.335	2 57 43.7	94.60
20	12 48 17.27	14.330	2 59 32.1	94.62	20 22 53.0	12 53 47.80	14.571	3 36 7.8	97.31
21	12 54 4.06	14.562	3 37 56.3	97.29	21 22 54.9	12 59 39.88	14.762	4 15 29.6	99.43
22	12 59 55.88	14.750	4 17 17.4	99.38	22 22 56.9	13 5 36.13	14.919	4 55 36.3	101.04
23	13 5 51.80	14.904	4 57 22.5	100.96	23 22 59.0	13 11 35.75	15.046	5 36 16.0	102.20
24	13 11 51.04	15.029	5 37 59.9	102.09	24 23 1.1	13 17 38.09	15.147	6 17 18.5	102.94
25	13 17 52.95	15.129	6 18 59.5	102.81	25 23 3.2	13 23 42.60	15.228	6 58 34.3	103.33
26	13 23 57.00	15.208	7 0 12.0	103.18	26 23 5.3	13 29 48.88	15.293	7 39 55.5	103.39
27	13 30 2.79	15.272	7 41 29.5	103.23	27 23 7.5	13 35 56.56	15.347	8 21 14.6	103.17
28	13 36 9.97	15.325	8 22 44.7	103.00	28 23 9.7	13 42 5.44	15.390	9 2 25.5	102.70
29	13 42 18.32	15.368	9 3 51.4	102.52	29 23 11.9	13 48 15.27	15.428	9 43 22.4	102.00
30	13 48 27.61	15.405	9 44 44.0	101 82	30 23 14.1	13 54 25.93	15.461	10 24 0.3	101.12
31	13 54 37.73	15.438	10 25 17.4	100.93	31 23 16.4	14 0 37.35	15.490	11 4 14.9	100.07
32	14 0 48.59	+15.467	−11 5 27.5	− 99.88	32 23 18.6	14 6 49.45	+15.518	−11 44 2.4	− 98.86

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	14 0 48.59	+15.467	−11 5 27.5	−99.88	1 23 18.6	14 6 49.45	+15.518	−11 44 2.4	−98.86
2	14 7 0.13	15.494	11 45 10.4	98.67	2 23 20.9	14 13 2.18	15.544	12 23 19.1	97.51
3	14 13 12.29	15.520	12 24 22.5	97.32	3 23 23.2	14 19 15.57	15.572	13 2 1.7	96.03
4	14 19 25.11	15.548	13 3 0.5	95.84	4 23 25.5	14 25 29.64	15.602	13 40 7.7	94.45
5	14 25 38.60	15.578	13 41 2.0	94.26	5 23 27.8	14 31 44.40	15.630	14 17 34.4	92.76
6	14 31 52.78	15.606	14 18 24.2	92.57	6 23 30.1	14 37 59.91	15.662	14 54 19.5	90.98
7	14 38 7.71	15.638	14 55 4.8	90.80	7 23 32.4	14 44 16.21	15.697	15 30 20.8	89.11
8	14 44 23.42	15.672	15 31 1.7	88.93	8 23 34.8	14 50 33.38	15.734	16 5 36.2	87.16
9	14 50 39.99	15.709	16 6 12.8	86.98	9 23 37.1	14 56 51.46	15.774	16 40 3.9	85.14
10	14 56 57.47	15.749	16 40 36.3	84.97	10 23 39.4	15 3 10.55	15.817	17 13 42.2	83.05
11	15 3 15.95	15.792	17 14 10.6	82.88	11 23 41.8	15 9 30.70	15.863	17 46 29.4	80.88
12	15 9 35.49	15.837	17 46 53.8	80.72	12 23 44.2	15 15 51.98	15.912	18 18 24.0	78.66
13	15 15 56.15	15.886	18 18 44.6	78.50	13 23 46.7	15 22 14.48	15.963	18 49 24.4	76.37
14	15 22 18.02	15.937	18 49 41.3	76.22	14 23 49.1	15 28 38.23	16.017	19 19 29.0	74.01
15	15 28 41.13	15.990	19 19 42.4	73.87	15 23 51.6	15 35 3.21	16.073	19 48 36.6	71.61
16	15 35 5.56	16.046	19 48 46.6	71.47	16 23 54.1	15 41 29.77	16.131	20 16 45.6	69.13
17	15 41 31.36	16.104	20 16 52.4	69.00	17 23 56.6	15 47 57.67	16.193	20 43 54.5	66.60
18	15 47 58.59	16.165	20 43 58.3	66.48	18 23 59.1	15 54 27.04	16.255	21 10 2.2	64.03
19	15 54 27.28	16.227	21 10 3.1	63.91					
20	16 0 57.48	16.290	21 35 5.3	61.27	20 0 1.7	16 0 57.94	16.319	21 35 7.0	61.38
21	16 7 29.21	16.354	21 59 3.4	58.57	21 0 4.3	16 7 30.38	16.384	21 59 7.6	58.67
22	16 14 2.47	16.418	22 21 56.3	55.82	22 0 6.9	16 14 4.36	16.448	22 22 2.7	55.91
23	16 20 37.28	16.483	22 43 42.4	53.01	23 0 9.5	16 20 39.90	16.514	22 43 50.8	53.09
24	16 27 13.65	16.547	23 4 20.2	50.14	24 0 12.2	16 27 17.02	16.578	23 4 30.4	50.21
25	16 33 51.54	16.610	23 23 48.4	47.20	25 0 14.9	16 33 55.67	16.642	23 24 0.1	47.26
26	16 40 30.91	16.671	23 42 5.5	44.22	26 0 17.6	16 40 35.81	16.703	23 42 18.5	44.25
27	16 47 11.73	16.730	23 59 10.2	41.16	27 0 20.4	16 47 17.41	16.763	23 59 24.2	41.19
28	16 53 53.91	16.785	24 15 0.7	38.05	28 0 23.1	16 54 0.38	16.818	24 15 15.4	38.07
29	17 0 37.39	16.837	24 29 36.1	34.88	29 0 25.9	17 0 44.67	16.871	24 29 51.2	34.89
30	17 7 22.05	16.884	24 42 54.6	31.65	30 0 28.7	17 7 30.14	16.918	24 43 9.8	31.65
Dec. 1	17 14 7.76	16.924	24 54 54.8	28.36	1 0 31.6	17 14 16.66	16.958	24 55 9.7	28.34
2	17 20 54.37	16.958	25 5 35.3	25.01	2 0 34.4	17 21 4.09	16.992	25 5 49.6	24.98
3	17 27 41.70	16.984	25 14 54.7	21.60	3 0 37.2	17 27 52.24	17.018	25 15 8.1	21.55
4	17 34 29.55	17.002	25 22 51.7	18.14	4 0 40.1	17 34 40.91	17.036	25 23 3.8	18.08
5	17 41 17.69	17.008	25 29 25.0	14.63	5 0 43.0	17 41 29.86	17.042	25 29 35.5	14.55
6	17 48 5.85	17.002	25 34 33.4	11.06	6 0 45.8	17 48 18.83	17.035	25 34 41.9	10.97
7	17 54 53.71	16.983	25 38 15.5	7.45	7 0 48.7	17 55 7.49	17.016	25 38 21.6	7.34
8	18 1 40.91	16.948	25 40 30.7	3.80	8 0 51.6	18 1 55.47	16.980	25 40 33.9	− 3.68
9	18 8 27.06	16.895	25 41 17.8	− 0.11	9 0 54.4	18 8 42.37	16.926	25 41 17.8	+ 0.03
10	18 15 11.71	16.822	25 40 35.9	+ 3.61	10 0 57.2	18 15 27.74	16.851	25 40 32.4	3.76
11	18 21 54.35	16.727	25 38 24.5	7.35	11 0 59.9	18 22 11.06	16.755	25 38 17.1	7.52
12	18 28 34.41	16.607	25 34 43.4	11.09	12 1 2.7	18 28 51.76	16.632	25 34 31.7	11.27
13	18 35 11.24	16.458	25 29 32.3	14.83	13 1 5.4	18 35 29.17	16.481	25 29 16.1	15.03
14	18 41 44.11	16.276	25 22 51.4	18.57	14 1 8.0	18 42 2.54	16.295	25 22 30.3	18.78
15	18 48 12.18	16.057	25 14 41.3	22.27	15 1 10.5	18 48 31.03	16.073	25 14 15.0	22.49
16	18 54 34.51	15.797	25 5 3.0	25.91	16 1 12.9	18 54 53.69	15.809	25 4 31.4	26.13
17	19 0 50.06	15.490	24 53 58.2	29.48	17 1 15.2	19 1 9.47	15.497	24 53 21.1	29.71
18	19 6 57.60	15.130	24 41 28.9	32.95	18 1 17.4	19 7 17.11	15.131	24 40 46.3	33.18
19	19 12 55.81	14.710	24 27 37.9	36.28	19 1 19.4	19 13 15.27	14.705	24 26 49.8	36.51
20	19 18 43.14	14.222	24 12 28.9	39.44	20 1 21.3	19 19 2.39	14.209	24 11 35.4	39.66
21	19 24 17.87	13.658	23 56 6.4	42.39	21 1 22.9	19 24 36.72	13.637	23 55 7.7	42.60
22	19 29 38.06	13.009	23 38 36.3	45.07	22 1 24.3	19 29 56.30	12.979	23 37 32.9	45.26
23	19 34 41.54	12.264	23 20 5.5	47.44	23 1 25.4	19 34 58.96	12.225	23 18 57.9	47.60
24	19 39 25.90	11.413	23 0 42.2	49.43	24 1 26.2	19 39 42.25	11.363	22 59 31.1	49.56
25	19 43 48.43	10.444	22 40 36.2	50.99	25 1 26.6	19 44 3.46	10.383	22 39 22.6	51.07
26	19 47 46.20	9.348	22 19 58.7	52.04	26 1 26.6	19 47 59.63	9.276	22 18 43.6	58.08
27	19 51 16.05	8.115	21 59 2.8	52.52	27 1 26.1	19 51 27.64	8.033	21 57 47.4	52.50
28	19 54 14.56	6.737	21 38 2.8	52.37	28 1 25.1	19 54 24.06	6.646	21 36 48.5	52.29
29	19 56 38.25	5.212	21 17 14.6	51.52	29 1 23.5	19 56 45.44	5.113	21 16 2.9	51.38
30	19 58 23.54	3.538	20 56 55.5	49.95	30 1 21.3	19 58 28.27	3.434	20 56 48.0	49.75
31	19 59 27.00	+ 1.727	20 37 23.2	47.62	31 1 18.4	19 59 29.18	+ 1.722	20 36 21.1	47.37
32	19 59 45.51	− 0.203	−20 18 55.8	+44.54	32 1 14.7	19 59 45.20	− 0.305	−20 18 0.5	+44.24

Date.	FOR WASHINGTON MEAN NOON.								FOR MERIDIAN TRANSIT.										
1877.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Mean Time of Transit.			Apparent Right Ascension.			Diff. for 1 h. of Long.	Apparent Declination.		
	h	m	s	s	°	′	″	″	d	h	m	h	m	s	s	°	′	″
Jan. 0	16	33	18.44	+13.017	-20	34	22.0	-32.86	0	21	52.6	16	38	3.63	+13.066	-20	46	6.6
1	16	38	31.35	13.059	20	47	13.4	31.42	1	21	53.9	16	43	17.74	13.104	20	58	26.8
2	16	43	45.27	13.100	20	59	29.9	29.95	2	21	55.2	16	48	32.79	13.143	21	10	11.6
3	16	49	0.12	13.139	21	11	10.9	28.45	3	21	56.5	16	53	48.78	13.181	21	21	20.4
4	16	54	15.90	13.177	21	22	15.9	26.94	4	21	57.8	16	59	5.69	13.218	21	31	52.3
5	16	59	32.59	13.213	21	32	44.1	25.41	5	21	59.1	17	4	23.46	13.253	21	41	47.1
6	17	4	50.13	13.248	21	42	35.2	23.85	6	22	0.5	17	9	42.03	13.285	21	51	4.2
7	17	10	8.47	13.280	21	51	48.6	22.27	7	22	1.9	17	15	1.38	13.316	21	59	43.2
8	17	15	27.57	13.311	22	0	23.9	20.67	8	22	3.3	17	20	21.46	13.345	22	7	43.5
9	17	20	47.40	13.340	22	8	20.6	19.05	9	22	4.7	17	25	42.21	13.373	22	15	4.9
10	17	26	7.89	13.367	22	15	38.4	17.42	10	22	6.1	17	31	3.58	13.398	22	21	46.7
11	17	31	28.09	13.392	22	22	16.7	15.77	11	22	7.5	17	36	25.53	13.420	22	27	48.8
12	17	36	50.66	13.413	22	28	15.3	14.11	12	22	9.0	17	41	47.98	13.440	22	33	10.7
13	17	42	12.83	13.434	22	33	33.8	12.43	13	22	10.4	17	47	10.90	13.458	22	37	52.3
14	17	47	35.46	13.452	22	38	12.0	10.74	14	22	11.9	17	42	34.22	13.473	22	41	53.0
15	17	52	58.48	13.467	22	42	9.4	9.04	15	22	13.3	17	57	57.89	13.486	22	45	12.8
16	17	58	21.85	13.480	22	45	26.0	7.33	16	22	14.8	18	3	21.84	13.496	22	47	51.4
17	18	3	45.49	13.490	22	48	1.4	5.62	17	22	16.2	18	8	46.01	13.505	22	49	48.8
18	18	9	9.35	13.498	22	49	55.7	3.90	18	22	17.7	18	14	10.35	13.510	22	51	4.7
19	18	14	33.37	13.503	22	51	8.6	2.17	19	22	19.1	18	19	34.79	13.513	22	51	39.1
20	18	19	57.49	13.506	22	51	40.0	– 0.44	20	22	20.6	18	24	59.28	13.514	22	51	31.8
21	18	25	21.65	13.507	22	51	29.8	+ 1.29	21	22	22.0	18	30	23.77	13.512	22	50	42.9
22	18	30	45.81	13.505	22	50	38.1	3.02	22	22	23.5	18	35	48.18	13.508	22	49	12.2
23	18	36	9.89	13.501	22	49	4.8	4.75	23	22	24.9	18	41	12.48	13.502	22	46	59.8
24	18	41	33.85	13.495	22	46	49.8	6.48	24	22	26.4	18	46	36.60	13.493	22	44	6.0
25	18	46	57.63	13.486	22	43	53.4	8.21	25	22	27.8	18	52	0.48	13.482	22	40	30.8
26	18	52	21.17	13.475	22	40	15.7	9.94	26	22	29.3	18	57	24.08	13.469	22	36	14.0
27	18	57	44.42	13.462	22	35	56.5	11.66	27	22	30.7	19	2	47.34	13.454	22	31	16.0
28	19	3	7.33	13.447	22	30	56.2	13.37	28	22	32.2	19	8	10.20	13.436	22	25	36.9
29	19	8	29.84	13.429	22	25	14.9	15.07	29	22	33.6	19	13	32.62	13.416	22	19	16.7
30	19	13	51.91	13.409	22	18	52.8	16.77	30	22	35.1	19	18	54.53	13.394	22	12	16.1
31	19	19	13.48	13.387	22	11	50.1	18.45	31	22	36.5	19	24	15.91	13.371	22	4	35.0
Feb. 1	19	24	34.51	13.364	22	4	7.1	20.13	1	22	37.9	19	29	36.69	13.345	21	56	13.7
2	19	29	54.94	13.338	21	55	44.0	21.79	2	22	39.3	19	34	56.84	13.318	21	47	12.6
3	19	35	14.74	13.311	21	46	41.2	23.44	3	22	40.7	19	40	16.29	13.288	21	37	32.0
4	19	40	33.85	13.281	21	36	59.0	25.07	4	22	42.1	19	45	35.01	13.257	21	27	12.3
5	19	45	52.23	13.250	21	26	37.8	26.69	5	22	43.4	19	50	52.96	13.224	21	16	14.0
6	19	51	9.84	13.217	21	15	38.0	28.29	6	22	44.7	19	56	10.10	13.189	21	4	37.5
7	19	56	26.64	13.182	21	4	0.1	29.87	7	22	46.0	20	1	26.37	13.153	20	52	23.0
8	20	1	42.58	13.146	20	51	44.3	31.44	8	22	47.3	20	6	41.75	13.115	20	39	31.2
9	20	6	57.63	13.108	20	38	51.3	32.98	9	22	48.6	20	11	56.20	13.076	20	26	2.5
10	20	12	11.75	13.069	20	25	21.5	34.50	10	22	49.9	20	17	9.70	13.035	20	11	57.5
11	20	17	24.92	13.028	20	11	15.5	36.00	11	22	51.1	20	22	22.20	12.993	19	57	16.8
12	20	22	37.10	12.986	19	56	33.9	37.47	12	22	52.4	20	27	33.68	12.949	19	42	1.0
13	20	27	48.26	12.943	19	41	17.2	38.92	13	22	53.6	29	32	44.10	12.905	19	26	10.5
14	20	32	58.37	12.899	19	25	25.9	40.35	14	22	54.8	20	37	53.46	12.860	19	9	45.9
15	20	38	7.42	12.854	19	9	0.6	41.75	15	22	56.0	20	43	1.73	12.815	18	52	48.0
16	20	43	15.38	12.809	18	52	2.1	43.12	16	22	57.2	20	48	8.89	12.769	18	35	17.5
17	20	48	22.24	12.763	18	34	31.0	44.47	17	22	58.4	20	53	14.93	12.722	18	17	14.8
18	20	53	27.99	12.716	18	16	27.8	45.79	18	22	59.6	20	58	19.84	12.675	17	58	40.6
19	20	58	32.61	12.669	17	57	53.2	47.08	19	23	0.7	21	3	23.61	12.628	17	39	35.8
20	21	3	36.10	12.622	17	38	48.0	48.35	20	23	1.8	21	8	26.23	12.580	17	20	0.8
21	21	8	38.44	12.574	17	19	12.7	49.59	21	23	2.8	21	13	27.70	12.533	16	59	56.4
22	21	13	39.64	12.527	16	59	8.0	50.80	22	23	3.9	21	18	28.02	12.484	16	39	23.2
23	21	18	39.69	12.479	16	38	34.6	51.98	23	23	4.9	21	23	27.19	12.436	16	18	21.9
24	21	23	38.60	12.431	16	17	33.1	53.13	24	23	5.9	21	28	25.21	12.389	15	56	53.2
25	21	28	36.37	12.384	15	56	4.3	54.26	25	23	6.9	21	33	22.11	12.342	15	34	57.9
26	21	33	33.02	12.337	15	34	8.9	55.35	26	23	7.9	21	38	17.88	12.295	15	12	36.5
27	21	38	28.55	12.290	15	11	47.5	56.42	27	23	8.8	21	43	12.53	12.249	14	49	49.9
28	21	43	22.96	12.244	14	49	0.9	57.45	28	23	9.8	21	48	6.07	12.204	14	26	38.7
29	21	48	16.27	12.199	14	25	49.8	58.46	29	23	10.7	21	52	58.54	12.158	14	3	3.6
30	21	53	8.52	12.154	14	2	14.8	59.44	30	23	11.6	21	57	49.94	12.114	13	39	5.4
31	21	57	59.70	+12.110	-13	38	16.8	+60.39	31	23	12.5	22	2	40.28	+12.071	-13	14	44.7

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	21 48 16.27	+12.199	−14 25 49.8	+58.46	1 23 10.7	21 52 58.54	+12.158	−14 3 3.6	+59.45
2	21 53 8.52	12.154	14 2 14.8	59.44	2 23 11.6	21 57 49.94	12.114	13 39 5.4	60.40
3	21 57 59.70	12.110	13 38 16.8	60.39	3 23 12.5	22 2 40.28	12.071	13 14 44.7	61.32
4	22 2 49.83	12.067	13 13 56.3	61.31	4 23 13.4	22 7 29.60	12.029	12 50 2.4	62.21
5	22 7 38.94	12.024	12 49 14.2	62.20	5 23 14.3	22 12 17.89	11.987	12 24 59.1	63.06
6	22 12 27.03	11.983	12 24 11.1	63.05	6 23 15.2	22 17 5.20	11.946	11 59 35.6	63.89
7	22 17 14.14	11.942	11 58 47.8	63.88	7 23 16.0	22 21 51.54	11.906	11 33 52.7	64.68
8	22 22 0.28	11.902	11 33 5.0	64.67	8 23 16.8	22 26 36.94	11.868	11 7 50.8	65.45
9	22 26 45.49	11.864	11 7 3.5	65.44	9 23 17.6	22 31 21.41	11.830	10 41 30.9	66.20
10	22 31 29.77	11.826	10 40 44.1	66.18	10 23 18.4	22 36 4.98	11.794	10 14 53.8	66.90
11	22 36 13.16	11.790	10 14 7.4	66.88	11 23 19.1	22 40 47.68	11.757	9 48 0.2	67.57
12	22 40 55.69	11.754	9 47 14.2	67.55	12 23 19.9	22 45 29.54	11.723	9 20 50.8	68.21
13	22 45 37.38	11.720	9 20 5.2	68.19	13 23 20.6	22 50 10.59	11.690	8 53 26.6	68.81
14	22 50 18.26	11.687	8 52 41.4	68.79	14 23 21.3	22 54 50.85	11.658	8 25 48.1	69.39
15	22 54 58.36	11.655	8 25 3.4	69.37	15 23 22.0	22 59 30.36	11.627	7 57 56.0	69.93
16	22 59 37.71	11.624	7 57 11.8	69.91	16 23 22.7	23 4 9.15	11.598	7 29 51.2	70.45
17	23 4 16.35	11.595	7 29 7.5	70.43	17 23 23.4	23 8 47.25	11.570	7 1 34.4	70.93
18	23 8 54.30	11.567	7 0 51.2	70.91	18 23 24.1	23 13 24.70	11.544	6 33 6.3	71.39
19	23 13 31.60	11.541	6 32 23.6	71.37	19 23 24.8	23 18 1.52	11.519	6 4 27.7	71.81
20	23 18 8.28	11.516	6 3 45.6	71.79	20 23 25.5	23 22 37.76	11.496	5 35 39.4	72.20
21	23 22 44.38	11.493	5 34 57.8	72.18	21 23 26.1	23 27 13.46	11.474	5 6 41.9	72.56
22	23 27 19.94	11.471	5 6 0.9	72.54	22 23 26.8	23 31 48.64	11.454	4 37 36.1	72.90
23	23 31 54.99	11.451	4 36 55.7	72.88	23 23 27.4	23 36 23.37	11.436	4 8 22.6	73.20
24	23 36 29.59	11.433	4 7 42.8	73.18	24 23 28.0	23 40 57.67	11.419	3 39 2.2	73.49
25	23 41 3.76	11.416	3 38 23.0	73.46	25 23 28.6	23 45 31.59	11.404	3 9 35.6	73.73
26	23 45 37.55	11.401	3 8 57.0	73.70	26 23 29.3	23 50 5.16	11.390	2 40 3.4	73.95
27	23 50 11.00	11.387	2 39 25.4	73.92	27 23 29.9	23 54 38.42	11.379	2 10 26.3	74.13
28	23 54 44.14	11.376	2 9 49.0	74.10	28 23 30.5	23 59 11.43	11.368	1 40 45.1	74.29
29	23 59 17.03	11.366	1 40 8.5	74.26	29 23 31.1	0 3 44.22	11.360	1 11 0.5	74.42
30	0 3 49.70	11.358	1 10 24.6	74.39	30 23 31.7	0 8 16.85	11.354	0 41 13.1	74.52
31	0 8 22.21	11.352	0 40 37.9	74.49	31 23 32.3	0 12 49.33	11.349	− 0 11 23.6	74.59
Apr. 1	0 12 54.58	11.347	− 0 10 49.1	74.56	1 23 32.9	0 17 21.73	11.346	+ 0 18 27.2	74.63
2	0 17 26.86	11.344	+ 0 19 1.0	74.60	2 23 33.4	0 21 54.09	11.345	0 48 18.7	74.64
3	0 21 59.11	11.343	0 48 51.7	74.61	3 23 34.0	0 26 26.45	11.346	1 18 9.9	74.62
4	0 26 31.35	11.344	1 18 42.2	74.59	4 23 34.6	0 30 58.83	11.349	1 48 0.5	74.57
5	0 31 3.62	11.347	1 48 32.0	74.54	5 23 35.2	0 35 31.29	11.353	2 17 49.6	74.50
6	0 35 35.97	11.351	2 18 20.3	74.47	6 23 35.8	0 40 3.88	11.359	2 47 36.5	74.39
7	0 40 8.45	11.357	2 48 6.4	74.36	7 23 36.4	0 44 36.63	11.366	3 17 20.4	74.25
8	0 44 41.09	11.364	3 17 49.5	74.22	8 23 37.0	0 49 9.59	11.375	3 47 0.7	74.08
9	0 49 13.94	11.373	3 47 29.0	74.05	9 23 37.6	0 53 42.78	11.386	4 16 36.6	73.89
10	0 53 47.02	11.384	4 17 4.1	73.86	10 23 38.3	0 58 16.26	11.399	4 46 7.3	73.66
11	0 58 20.39	11.397	4 46 34.0	73.63	11 23 38.9	1 2 50.05	11.413	5 15 32.1	73.41
12	1 2 54.07	11.411	5 15 58.0	73.37	12 23 39.5	1 7 24.22	11.429	5 44 50.4	73.12
13	1 7 28.12	11.427	5 45 15.4	73.08	13 23 40.1	1 11 58.77	11.446	6 14 1.4	72.80
14	1 12 2.56	11.444	6 14 25.5	72.76	14 23 40.8	1 16 33.76	11.465	6 43 4.3	72.44
15	1 16 37.43	11.462	6 43 27.5	72.40	15 23 41.4	1 21 9.21	11.485	7 11 58.3	72.06
16	1 21 12.76	11.482	7 12 20.6	72.02	16 23 42.1	1 25 45.18	11.507	7 40 42.9	71.65
17	1 25 48.61	11.504	7 41 4.3	71.61	17 23 42.7	1 30 21.68	11.531	8 9 17.3	71.21
18	1 30 24.99	11.528	8 9 37.8	71.17	18 23 43.4	1 34 58.76	11.556	8 37 40.6	70.74
19	1 35 1.95	11.553	8 38 0.1	70.70	19 23 44.1	1 39 36.45	11.582	9 5 52.2	70.23
20	1 39 39.52	11.579	9 6 10.8	70.19	20 23 44.8	1 44 14.81	11.610	9 33 51.6	69.70
21	1 44 17.75	11.607	9 34 9.2	69.66	21 23 45.5	1 48 53.85	11.639	10 1 37.7	69.14
22	1 48 56.66	11.636	10 1 54.4	69.10	22 23 46.2	1 53 33.42	11.670	10 29 10.0	68.54
23	1 53 36.30	11.667	10 29 25.7	68.50	23 22 46.9	1 58 14.13	11.702	10 56 27.5	67.91
24	1 58 16.68	11.699	10 56 42.3	67.88	24 23 47.7	2 2 55.45	11.736	11 23 29.7	67.26
25	2 2 57.86	11.733	11 23 43.5	67.22	25 23 48.4	2 7 37.58	11.771	11 50 15.9	66.58
26	2 7 39.85	11.768	11 50 28.7	66.54	26 23 49.2	2 12 20.57	11.807	12 16 45.3	65.86
27	2 12 22.69	11.804	12 16 57.1	65.82	27 23 50.0	2 17 4.45	11.844	12 42 57.2	65.12
28	2 17 6.42	11.841	12 43 8.0	65.08	28 23 50.8	2 21 49.23	11.883	13 8 50.8	64.34
29	2 21 51.05	11.880	13 9 0.7	64.30	29 23 51.6	2 26 34.96	11.922	13 34 25.6	63.54
30	2 26 36.62	11.919	13 34 34.5	63.50	30 23 52.5	2 31 21.67	11.963	13 59 40.6	62.70
31	2 31 23.17	+11.960	+13 59 48.5	+62.66	31 23 53.3	2 36 9.37	+12.005	+14 24 35.2	+61.84

VENUS, 1877.

Date. 1877.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	2 31 23.17	+11.960	+13 59 48.5	+62.66	1 23 53.3	2 36 9.37	+12.005	+14 24 36.2	+61.84
2	2 36 10.70	12.002	14 24 42.1	61.80	2 23 54.2	2 40 58.10	12.049	14 49 8.5	60.94
3	2 40 59.26	12.045	14 49 14.5	60.90	3 23 55.1	2 45 47.86	12.092	15 13 20.0	60.01
4	2 45 48.85	12.088	15 13 25.0	59.97	4 23 56.0	2 50 38.69	12.137	15 37 8.8	59.05
5	2 50 39.60	12.133	15 37 12.8	59.01	5 23 56.9	2 55 30.59	12.182	16 0 34.3	58.06
6	2 55 31.22	12.178	16 0 37.3	58.02	6 23 57.9	3 0 23.59	12.228	16 23 35.5	57.04
7	3 0 24.03	12.224	16 23 37.6	57.00	7 23 58.8	3 5 17.70	12.274	16 46 11.9	55.99
8	3 5 17.95	12.270	16 46 13.1	55.95	8 23 59.8	3 10 12.92	12.320	17 8 22.7	54.90
9	3 10 12.97	12.316	17 8 22.9	54.86					
10	3 15 9.12	12.363	17 30 6.3	53.75	10 0 0.8	3 15 9.27	12.367	17 30 7.0	53.79
11	3 20 6.39	12.410	17 51 22.6	52.60	11 0 1.8	3 20 6.75	12.414	17 51 24.1	52.64
12	3 25 4.79	12.457	18 12 11.1	51.43	12 0 2.8	3 25 5.37	12.462	18 12 13.5	51.46
13	3 30 4.32	12.504	18 32 30.9	50.22	13 0 3.9	3 30 5.12	12.509	18 32 34.1	50.25
14	3 35 4.98	12.551	18 52 21.4	48.97	14 0 4.9	3 35 6.01	12.556	18 52 25.4	49.00
15	3 40 6.76	12.598	19 11 42.1	47.70	15 0 6.0	3 40 8.02	12.603	19 11 46.9	47.73
16	3 45 9.66	12.644	19 30 32.1	46.42	16 0 7.1	3 45 11.16	12.649	19 30 37.6	46.45
17	3 50 13.67	12.690	19 48 50.7	45.11	17 0 8.2	3 50 15.41	12.695	19 48 56.9	45.14
18	3 55 18.78	12.736	20 6 37.2	43.76	18 0 9.3	3 55 20.77	12.741	20 6 44.1	43.79
19	4 0 24.99	12.781	20 23 51.0	42.39	19 0 10.5	4 0 27.23	12.786	20 23 58.5	42.41
20	4 5 32.27	12.825	20 40 31.6	40.99	20 0 11.7	4 5 34.77	12.830	20 40 39.7	41.01
21	4 10 40.60	12.869	20 56 38.2	39.56	21 0 12.9	4 10 43.37	12.874	20 56 46.8	39.58
22	4 15 49.96	12.912	21 12 10.3	38.11	22 0 14.1	4 15 53.00	12.917	21 12 19.3	38.13
23	4 21 0.34	12.953	21 27 7.1	36.63	23 0 15.4	4 21 3.66	12.958	21 27 16.5	36.64
24	4 26 11.71	12.994	21 41 28.1	35.12	24 0 16.6	4 26 15.31	12.999	21 41 37.8	35.13
25	4 31 24.06	13.034	21 55 12.6	33.59	25 0 17.9	4 31 27.94	13.039	21 55 22.6	33.60
26	4 36 37.36	13.073	22 8 20.1	32.04	26 0 19.2	4 36 41.53	13.078	22 8 30.3	32.05
27	4 41 51.57	13.111	22 20 50.1	30.47	27 0 20.5	4 41 56.04	13.116	22 21 0.5	30.47
28	4 47 6.67	13.147	22 32 42.2	28.88	28 0 21.8	4 47 11.44	13.152	22 32 52.7	28.88
29	4 52 22.61	13.181	22 43 55.9	27.27	29 0 23.1	4 52 27.68	13.186	22 44 6.4	27.27
30	4 57 39.35	13.214	22 54 30.8	25.64	30 0 24.4	4 57 44.73	13.220	22 54 41.2	25.64
31	5 2 56.87	13.245	23 4 26.3	23.99	31 0 25.8	5 3 2.56	13.251	23 4 36.6	23.98
June 1	5 8 15.12	13.275	23 13 42.0	22.32	1 0 27.1	5 8 21.12	13.281	23 13 52.1	22.31
2	5 13 34.05	13.302	23 22 17.5	20.63	2 0 28.5	5 13 40.37	13.308	23 22 27.3	20.61
3	5 18 53.62	13.328	23 30 12.3	18.93	3 0 29.9	5 19 0.26	13.334	23 30 21.7	18.91
4	5 24 13.78	13.352	23 37 26.0	17.21	4 0 31.3	5 24 20.74	13.358	23 37 35.0	17.19
5	5 29 34.49	13.373	23 43 58.4	15.48	5 0 32.7	5 29 41.77	13.379	23 44 6.8	15.45
6	5 34 55.67	13.392	23 49 49.0	13.74	6 0 34.1	5 35 3.28	13.398	23 49 56.8	13.71
7	5 40 17.28	13.409	23 54 57.8	11.99	7 0 35.5	5 40 25.21	13.415	23 55 4.9	11.96
8	5 45 39.29	13.423	23 59 24.3	10.22	8 0 36.9	5 45 47.55	13.429	23 59 30.6	10.18
9	5 51 1.60	13.435	24 3 8.5	8.45	9 0 38.3	5 51 10.18	13.441	24 3 13.9	8.41
10	5 56 24.17	13.445	24 6 10.0	6.67	10 0 39.8	5 56 33.08	13.451	24 6 14.4	6.62
11	6 1 46.93	13.452	24 8 28.8	4.89	11 0 41.2	6 1 56.16	13.458	24 8 32.1	4.84
12	6 7 9.82	13.456	24 10 4.6	3.10	12 0 42.7	6 7 19.38	13.462	24 10 6.8	3.05
13	6 12 32.78	13.458	24 10 57.5	+ 1.31	13 0 44.1	6 12 42.66	13.464	24 10 58.4	+ 1.25
14	6 17 55.75	13.457	24 11 7.4	− 0.49	14 0 45.6	6 18 5.95	13.463	24 11 7.0	− 0.55
15	6 23 18.66	13.453	24 10 34.3	2.28	15 0 47.0	6 23 29.18	13.459	24 10 32.4	2.34
16	6 28 41.45	13.446	24 9 18.1	4.07	16 0 48.5	6 28 52.29	13.452	24 9 14.7	4.14
17	6 34 4.05	13.437	24 7 18.9	5.86	17 0 49.9	6 34 15.20	13.443	24 7 13.9	5.93
18	6 39 26.41	13.426	24 4 36.7	7.65	18 0 51.3	6 39 37.87	13.432	24 4 30.1	7.72
19	6 44 48.47	13.412	24 1 11.7	9.43	19 0 52.7	6 45 0.24	13.418	24 1 3.3	9.51
20	6 50 10.17	13.396	23 57 4.0	11.20	20 0 54.2	6 50 22.24	13.402	23 56 53.8	11.28
21	6 55 31.45	13.377	23 52 13.9	12.97	21 0 55.6	6 55 43.82	13.383	23 52 1.8	13.05
22	7 0 52.24	13.356	23 46 41.4	14.73	22 0 57.0	7 1 4.91	13.362	23 46 27.3	14.81
23	7 6 12.50	13.332	23 40 26.8	16.48	23 0 58.4	7 6 25.46	13.338	23 40 10.7	16.57
24	7 11 32.17	13.306	23 33 30.5	18.22	24 0 59.8	7 11 45.42	13.312	23 33 12.3	18.31
25	7 16 51.20	13.279	23 25 52.6	19.94	25 1 1.2	7 17 4.73	13.285	23 25 32.2	20.03
26	7 22 9.54	13.250	23 17 33.3	21.65	26 1 2.5	7 22 13.35	13.256	23 17 10.7	21.75
27	7 27 27.16	13.218	23 8 33.1	23.35	27 1 3.9	7 27 41.22	13.223	23 8 8.2	23.45
28	7 32 43.97	13.184	22 58 52.4	25.03	28 1 5.2	7 32 58.30	13.189	22 58 25.1	25.13
29	7 37 59.96	13.148	22 48 31.5	26.70	29 1 6.5	7 38 14.54	13.153	22 48 1.8	26.80
30	7 43 15.09	13.111	22 37 30.8	28.35	30 1 7.8	7 43 29.92	13.116	22 36 58.7	28.45
31	7 48 29.31	+13.073	+22 25 50.8	−29.98	31 1 9.1	7 48 44.38	+13.078	+22 25 16.2	−30.08

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	7 48 29.31	+13.073	+22 25 50.8	−29.98	1 1 9.1	7 48 44.38	+13.078	+22 25 16.2	−30.08
2	7 53 42.59	13.033	22 13 31.8	31.59	2 1 10.4	7 53 57.89	13.038	22 12 54.7	31.69
3	7 58 54.89	12.992	22 0 34.4	33.19	3 1 11.7	7 59 10.41	12.997	21 59 54.8	33.30
4	8 4 6.17	12.949	21 46 59.0	34.76	4 1 12.9	8 4 21.91	12.954	21 46 16.8	34.87
5	8 9 16.41	12.904	21 32 46.2	36.30	5 1 14.1	8 9 32.36	12.909	21 32 1.4	36.41
6	8 14 25.57	12.858	21 17 56.6	37.83	6 1 15.3	8 14 41.72	12.863	21 17 9.1	37.94
7	8 19 33.62	12.812	21 2 30.7	39.33	7 1 16.5	8 19 49.96	12.817	21 1 40.6	39.44
8	8 24 40.53	12.764	20 46 29.0	40.81	8 1 17.7	8 24 57.06	12.769	20 45 36.2	40.92
9	8 29 46.29	12.715	20 29 52.0	42.27	9 1 18.9	8 30 3.00	12.720	20 28 56.5	42.38
10	8 34 50.87	12.665	20 12 40.4	43.69	10 1 20.0	8 35 7.75	12.670	20 11 42.2	43.80
11	8 39 54.23	12.615	19 54 55.0	45.09	11 1 21.1	8 40 11.28	12.620	19 53 54.1	45.20
12	8 44 56.39	12.564	19 36 36.3	46.46	12 1 22.2	8 45 13.60	12.569	19 35 32.6	46.57
13	8 49 57.33	12.513	19 17 45.1	47.90	13 1 23.3	8 50 14.69	12.517	19 16 38.7	47.91
14	8 54 57.02	12.461	18 58 21.9	49.12	14 1 24.3	8 55 14.53	12.465	18 57 12.8	49.23
15	8 59 55.45	12.409	18 38 27.5	50.41	15 1 25.4	9 0 13.10	12.413	18 37 15.7	50.52
16	9 4 52.64	12.357	18 18 2.6	51.67	16 1 26.4	9 5 10.42	12.361	18 16 48.1	51.78
17	9 9 48.56	12.304	17 57 7.8	52.90	17 1 27.4	9 10 6.47	12.318	17 55 50.6	53.01
18	9 14 43.21	12.251	17 35 43.8	54.10	18 1 28.4	9 15 1.24	12.255	17 34 24.0	54.21
19	9 19 36.60	12.198	17 13 51.4	55.27	19 1 29.3	9 19 54.74	12.202	17 12 29.0	55.37
20	9 24 28.73	12.146	16 51 31.3	56.41	20 1 30.2	9 24 46.98	12.150	16 50 6.4	56.51
21	9 29 19.61	12.094	16 28 44.1	57.52	21 1 31.1	9 29 37.96	12.098	16 27 16.7	57.62
22	9 34 9.24	12.043	16 5 30.6	58.60	22 1 32.0	9 34 27.69	12.047	16 4 0.8	58.70
23	9 38 57.65	11.992	15 41 51.4	59.65	23 1 32.9	9 39 16.20	11.995	15 40 19.1	59.75
24	9 43 44.84	11.942	15 17 47.4	60.67	24 1 33.7	9 44 3.48	11.945	15 16 12.7	60.77
25	9 48 30.83	11.892	14 53 19.2	61.67	25 1 34.5	9 48 49.56	11.895	14 51 42.1	61.77
26	9 53 15.64	11.843	14 28 27.5	62.63	26 1 35.3	9 53 34.45	11.846	14 26 48.0	62.73
27	9 57 59.28	11.794	14 3 13.1	63.56	27 1 36.1	9 58 18.17	11.797	14 1 31.3	63.66
28	10 2 41.78	11.747	13 37 36.7	64.46	28 1 36.9	10 3 0.75	11.750	13 35 52.6	64.55
29	10 7 23.16	11.701	13 11 39.0	65.34	29 1 37.7	10 7 42.20	11.704	13 9 52.7	65.43
30	10 12 3.45	11.656	12 45 20.6	66.18	30 1 38.4	10 12 22.56	11.659	12 43 32.2	66.27
31	10 16 42.67	11.612	12 18 42.3	67.00	31 1 39.1	10 17 1.85	11.615	12 16 51.8	67.09
Aug. 1	10 21 20.85	11.569	11 51 44.9	67.78	1 1 39.8	10 21 40.09	11.572	11 49 52.3	67.86
2	10 25 58.03	11.528	11 24 29.0	68.54	2 1 40.5	10 26 7.33	11.531	11 22 34.4	68.62
3	10 30 34.22	11.488	10 56 55.4	69.26	3 1 41.1	10 30 53.58	11.491	10 54 58.8	69.34
4	10 35 9.46	11.449	10 29 4.7	69.96	4 1 41.7	10 35 28.88	11.452	10 27 6.2	70.04
5	10 39 43.77	11.411	10 0 57.7	70.62	5 1 42.3	10 40 3.24	11.414	9 58 57.3	70.70
6	10 44 17.19	11.374	9 32 35.1	71.25	6 1 42.9	10 44 36.72	11.377	9 30 32.9	71.32
7	10 48 49.75	11.339	9 3 57.7	71.85	7 1 43.5	10 49 9.33	11.341	9 1 53.7	71.92
8	10 53 21.48	11.305	8 35 6.1	72.43	8 1 44.1	10 53 41.11	11.307	8 33 0.4	72.50
9	10 57 52.41	11.273	8 6 1.2	72.97	9 1 44.7	10 58 12.09	11.275	8 3 53.8	73.04
10	11 2 22.57	11.242	7 36 43.7	73.48	10 1 45.3	11 2 42.30	11.244	7 34 34.7	73.54
11	11 6 52.01	11.212	7 7 14.2	73.96	11 1 45.8	11 7 11.79	11.214	7 5 3.7	74.02
12	11 11 20.76	11.184	6 37 33.6	74.42	12 1 46.4	11 11 40.59	11.186	6 35 21.6	74.48
13	11 15 48.83	11.157	6 7 42.5	74.84	13 1 46.9	11 16 8.70	11.159	6 5 29.1	74.89
14	11 20 16.29	11.132	5 37 41.6	75.23	14 1 47.4	11 20 36.21	11.134	5 35 26.9	75.28
15	11 24 43.16	11.108	5 7 31.7	75.59	15 1 47.9	11 25 3.13	11.110	5 5 15.7	75.64
16	11 29 9.48	11.086	4 37 13.5	75.92	16 1 48.4	11 29 29.50	11.088	4 34 56.3	75.97
17	11 33 35.28	11.065	4 6 47.8	76.22	17 1 48.9	11 33 55.36	11.067	4 4 29.4	76.27
18	11 38 0.61	11.046	3 36 15.2	76.49	18 1 49.4	11 38 20.74	11.048	3 33 55.7	76.53
19	11 42 25.50	11.029	3 5 36.5	76.73	19 1 49.9	11 42 45.69	11.031	3 3 16.0	76.77
20	11 46 50.00	11.013	2 34 52.3	76.95	20 1 50.4	11 47 10.25	11.015	2 32 30.8	76.99
21	11 51 14.14	10.999	2 4 3.3	77.13	21 1 50.8	11 51 34.45	11.001	2 1 40.9	77.17
22	11 55 37.97	10.987	1 33 10.2	77.29	22 1 51.3	11 55 58.34	10.990	1 30 46.9	77.32
23	12 0 1.53	10.977	1 2 13.7	77.42	23 1 51.7	12 0 21.96	10.980	0 59 49.6	77.45
24	12 4 24.86	10.968	0 31 14.5	77.52	24 1 52.2	12 4 45.35	10.971	+ 0 28 49.6	77.55
25	12 8 48.00	10.961	+ 0 0 13.2	77.59	25 1 52.6	12 9 8.56	10.964	− 0 2 12.4	77.62
26	12 13 11.00	10.956	− 0 30 49.4	77.63	26 1 53.1	12 13 31.63	10.959	0 33 15.6	77.65
27	12 17 33.91	10.953	1 1 52.6	77.64	27 1 53.5	12 17 54.61	10.956	1 4 19.4	77.66
28	12 21 56.77	10.952	1 32 55.9	77.63	28 1 53.9	12 22 17.55	10.955	1 35 23.2	77.65
29	12 26 19.62	10.953	2 3 58.5	77.59	29 1 54.3	12 26 40.48	10.957	2 6 26.3	77.61
30	12 30 42.52	10.955	2 34 59.9	77.52	30 1 54.7	12 31 3.47	10.959	2 37 28.2	77.54
31	12 35 5.46	+10.959	− 3 5 59.2	−77.42	31 1 55.2	12 35 26.50	+10.963	− 3 8 27.9	−77.43

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	12 39 28.54	+10.965	− 3 36 55.9	−77.29	1 1 55.6	12 39 49.67	+10.969	− 3 39 24.9	−77.30
2	12 43 51.79	10.972	4 7 49.1	77.13	2 1 56.1	12 44 13.02	10.976	4 10 18.4	77.14
3	12 48 15.24	10.982	4 38 38.2	76.95	3 1 56.5	12 48 36.57	10.987	4 41 7.7	76.96
4	12 52 38.93	10.993	5 9 22.5	76.73	4 1 57.0	12 53 0.37	10.998	5 11 52.2	76.73
5	12 57 2.90	11.005	5 40 1.3	76.49	5 1 57.4	12 57 24.45	11.010	5 42 31.1	76.49
6	13 1 27 20	11.020	6 10 33.9	76.21	6 1 57.9	13 1 48.86	11.025	6 13 3.7	76.21
7	13 5 51.86	11.036	6 40 59.5	75.91	7 1 58.4	13 6 13.64	11.041	6 43 29.3	75.91
8	13 10 16.93	11.053	7 11 17.5	75.57	8 1 58.9	13 10 38.83	11.058	7 13 47.2	75.57
9	13 14 42.43	11.072	7 41 27.0	75.21	9 1 59.4	13 15 4.46	11.077	7 43 56.6	75.20
10	13 19 8.40	11.092	8 11 27.4	74.81	10 1 59.9	13 19 30.56	11.098	8 13 56.8	74.80
11	13 23 34.88	11.114	8 41 18.0	74.39	11 2 0.4	13 23 57.17	11.120	8 43 47.2	74.38
12	13 28 1.90	11.137	9 10 58.0	73.93	12 2 0.9	13 28 24.33	11.143	9 13 26.9	73.92
13	13 32 29.50	11.162	9 40 26.7	73.45	13 2 1.4	13 32 52.08	11.168	9 42 55.3	73.43
14	13 36 57.70	11.188	10 9 43.3	72.93	14 2 2.0	13 37 20.43	11.196	10 12 11.5	72.91
15	13 41 26.53	11.215	10 38 47.1	72.38	15 2 2.5	13 41 49.42	11.222	10 41 14.8	72.36
16	13 45 56.04	11.244	11 7 37.4	71.80	16 2 3.1	13 46 19.09	11.251	11 10 4.6	71.78
17	13 50 26.25	11.274	11 36 13.4	71.19	17 2 3.6	13 50 49.47	11.281	11 38 40.0	71.17
18	13 54 57.19	11.306	12 4 34.5	70.55	18 2 4 2	13 55 20.58	11.313	12 7 0.5	70.52
19	13 59 28.90	11.338	12 32 39.8	69.88	19 2 4.8	13 59 52.47	11.346	12 35 5.1	69.85
20	14 4 1.40	11.372	13 0 28.7	69.18	20 2 5.4	14 4 25.15	11.380	13 2 53.2	69.15
21	14 8 34.71	11.406	13 28 0.5	68.46	21 2 6.0	14 8 58.65	11.414	13 30 24.2	68.42
22	14 13 8.88	11.442	13 55 14.5	67.70	22 2 6.6	14 13 33.02	11.450	13 57 37.2	67.66
23	14 17 43.92	11.479	14 22 9.9	66.91	23 2 7.2	14 18 8.26	11.488	14 24 31.6	66.87
24	14 22 19.87	11.517	14 48 45.9	66.09	24 2 7.9	14 22 44.42	11.526	14 51 6.6	66.04
25	14 26 56.75	11.556	15 15 1.9	65.24	25 2 8.5	14 27 21.51	11.565	15 17 21.5	65.19
26	14 31 34.58	11.596	15 40 57.2	64.36	26 2 9.2	14 31 59.56	11.605	15 43 15.7	64.31
27	14 36 13.38	11.637	16 6 31.0	65.45	27 2 9.9	14 36 38.58	11.647	16 8 48.3	63.40
28	14 40 53.19	11.679	16 31 42.6	62.51	28 2 10.6	14 41 18.62	11.689	16 33 58.6	62.45
29	14 45 34.01	11.722	16 56 31.4	61.55	29 2 11.3	14 45 59.68	11.732	16 58 46.0	61.49
30	14 50 15.87	11.766	17 20 56 6	60.55	30 2 12.1	14 50 41.78	11.776	17 23 9.8	60.49
Oct. 1	14 54 58.77	11.810	17 44 57.4	59.52	1 2 12.9	14 55 24.93	11.820	17 47 9.1	59.45
2	14 59 42.73	11.854	18 8 33.1	58.45	2 2 13.7	15 0 9.14	11.865	18 10 43.2	58.38
3	15 4 27.76	11.899	18 31 43.0	57.36	3 2 14.5	15 4 54.43	11.910	18 33 51.4	27.29
4	15 9 13.87	11.944	18 54 26.2	56.23	4 2 15.3	15 9 40.81	11.955	18 56 32.9	56.16
5	15 14 1.05	11.988	19 16 42.2	55.08	5 2 16.1	15 14 28.26	11.999	19 18 47.1	55.00
6	15 18 49.31	12.033	19 38 30.1	53.90	6 2 17.0	15 19 16.79	12.045	19 40 33.1	53.82
7	15 23 38.64	12.078	19 59 49.4	52.69	7 2 17.9	15 24 6.40	12.090	20 1 50.4	52.60
8	15 28 29.05	12.122	20 20 39.1	51.45	8 2 18.8	15 28 57.09	12.134	20 22 38.0	51.36
9	15 33 20.51	12.166	20 40 58.7	50.18	9 2 19.7	15 33 48.84	12.178	20 42 55.4	50.08
10	15 38 13.02	12.209	21 0 47.4	48.88	10 2 20.7	15 38 41.64	12.221	21 2 41.8	48.78
11	15 43 6.55	12.252	21 20 4.6	47.55	11 2 21.6	15 43 35.46	12.264	21 21 56.6	47.45
12	15 48 1.10	12.293	21 38 49.3	46.19	12 2 22.6	15 48 30.31	12.306	21 40 38.8	46.08
13	15 52 56 63	12.334	21 57 1.1	44.80	13 2 23.6	15 53 26.14	12.347	21 58 48.0	44.69
14	15 57 53.13	12.373	22 14 39.4	43.39	14 2 24.6	15 58 22.94	12.386	22 16 23.7	43.28
15	16 2 50.56	12.412	22 31 43.6	41.95	15 2 25.6	16 3 20.67	12.425	22 33 25.2	41.83
16	16 7 48.91	12.450	22 48 12.8	40.49	16 2 26.7	16 8 19.33	12.463	22 49 51.6	40.37
17	16 12 48.14	12.486	23 4 6.6	39.00	17 2 27.7	16 13 18.87	12.499	23 5 42.4	38.87
18	16 17 48.22	12.520	23 19 24.6	37.49	18 2 28.8	16 18 19.26	12.533	23 20 57.4	37.36
19	16 22 49.10	12.553	23 34 5.9	35.95	19 2 29.8	16 23 20.45	12.566	23 35 35.5	35.81
20	16 27 50.75	12.584	23 48 10.2	34.40	20 2 30.9	16 28 22.41	12.597	23 49 36.5	34.26
21	16 32 53.13	12 613	24 1 36.8	32.82	21 2 32.0	16 33 25.10	12.626	24 2 59.7	32.68
22	16 37 56.19	12.641	24 14 25.4	31.23	22 2 33.1	16 38 28.46	12.654	24 15 44.9	31.08
23	16 42 59.89	12.667	24 26 35.4	29.61	23 2 34.2	16 43 32.46	12.679	24 27 51.3	29.46
24	16 48 4.19	12.691	24 38 6.4	27.97	24 2 35.4	16 48 37.06	12.703	24 39 18.6	27.81
25	16 53 9.03	12.713	24 48 58.0	26.32	25 2 36.5	16 53 42.20	12.725	24 50 6.4	26.16
26	16 58 14.39	12.733	24 59 9.7	24.65	26 2 37.7	16 58 47.85	12.745	25 0 14.3	24.48
27	17 3 20.18	12.750	25 8 41.1	12.97	27 2 38.8	17 3 33.93	12.762	25 9 41.7	22.80
28	17 8 26.36	12.765	25 17 31.9	21.27	28 2 40.0	17 9 0.40	12.777	25 18 28.4	21 10
29	17 13 32 86	12.777	25 25 42.0	19.56	29 2 41.1	17 14 7.18	12.788	25 26 34.3	19.38
30	17 18 39.63	12.787	25 33 10.9	17.83	30 2 42.3	17 19 14.22	12.798	25 33 58.5	17.65
31	17 23 46.60	12.794	25 39 58.3	16.10	31 2 43.4	17 24 21.46	12.805	25 40 41.8	15.91
32	17 28 53.70	+12.798	−25 46 3.9	−14.36	32 2 44.6	17 29 28.82	+12.808	−25 46 42.9	−14.17

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	17 28 53.70	+12.798	-25 46 3.9	-14.36	1 2 44.6	17 29 28.82	+12.808	-25 46 42.9	-14.17
2	17 34 0.87	12.799	25 51 27.5	12.61	2 2 45.8	17 34 36.24	12.809	25 52 2.0	12.42
3	17 39 8.03	12.797	25 56 9.0	10.85	3 2 47.0	17 39 43.65	12.807	25 56 38.9	10.65
4	17 44 15.10	12.792	26 0 8.2	9.08	4 2 48.2	17 44 50.96	12.801	26 0 33.4	8.88
5	17 49 22.01	12.784	26 3 25.1	7.32	5 2 49.4	17 49 58.10	12.793	26 3 45.5	7.12
6	17 54 28.69	12.772	26 5 59.6	5.55	6 2 50.6	17 55 5.00	12.780	26 6 15.1	5.34
7	17 59 35.04	12.757	26 7 51.5	3.78	7 2 51.7	18 0 11.55	12.765	26 8 2.0	3.57
8	18 4 40.98	12.738	26 9 1.0	2.01	8 2 52.9	18 5 17.67	12.745	26 9 6.5	1.80
9	18 9 46.43	12.716	26 9 28.0	– 0.24	9 2 54.0	18 10 23.29	12.723	26 9 28.4	– 0.02
10	18 14 51.30	12.690	26 9 12.7	+ 1.52	10 2 55.1	18 15 28.32	12.696	26 9 7.9	+ 1.74
11	18 19 55.51	12.660	26 8 15.0	3.28	11 2 56.2	18 20 32.68	12.666	26 8 5.0	3.50
12	18 24 58.97	12.627	26 6 35.2	5.03	12 2 57.3	18 25 36.28	12.632	26 6 20.0	5.25
13	18 30 1.60	12.591	26 4 13.5	6.78	13 2 58.4	18 30 39.03	12.596	26 3 53.0	7.00
14	18 35 3.31	12.551	26 1 10.1	8.52	14 2 59.5	18 35 40.85	12.555	26 0 44.3	8.73
15	18 40 4.00	12.508	25 57 25.2	10.23	15 3 0.6	18 40 41.63	12.511	25 56 54.1	10.45
16	18 45 3.60	12.461	25 52 59.3	11.93	16 3 1.7	18 45 41.31	12.463	25 52 2.9	12.15
17	18 50 2.05	12.411	25 47 52.6	13.62	17 3 2.7	18 50 39.82	12.413	25 47 10.8	13.84
18	18 54 59.25	12.357	25 42 5.4	15.30	18 3 3.7	18 55 37.07	12.358	25 41 18.3	15.52
19	18 59 55.11	12.299	25 35 38.2	16.96	19 3 4.7	19 0 32.96	12.300	25 34 45.7	17.18
20	19 4 49.58	12.239	25 28 31.4	18.61	20 3 5.7	19 5 27.45	12.239	25 27 33.6	18.83
21	19 9 42.57	12.176	25 20 45.3	20.23	21 3 6.6	19 10 20.44	12.175	25 19 42.1	20.45
22	19 14 34.01	12.110	25 12 20.6	21.83	22 3 7.5	19 15 11.86	12.108	25 11 12.1	22.05
23	19 19 23.83	12.041	25 3 17.6	23.41	23 3 8.4	19 20 1.64	12.038	25 2 3.8	23.63
24	19 24 11.98	11.970	24 53 36.9	24.97	24 3 9.3	19 24 49.73	11.967	24 52 17.8	25.19
25	19 28 58.37	11.896	24 43 19.1	26.51	25 3 10.1	19 29 36.04	11.892	24 41 54.8	26.72
26	19 33 42.95	11.819	24 32 24.7	28.02	26 3 10.9	19 34 20.53	11.815	24 30 55.2	28.23
27	19 38 25.65	11.739	24 20 54.3	29.51	27 3 11.6	19 39 3.13	11.734	24 19 19.7	29.72
28	19 43 6.41	11.657	24 8 48.5	30.97	28 3 12.4	19 43 43.77	11.651	24 7 8.9	31.18
29	19 47 45.17	11.572	23 56 8.0	32.41	29 3 13.1	19 48 22.39	11.566	23 54 23.4	32.61
30	19 52 21.86	11.485	23 42 53.4	33.81	30 3 13.8	19 52 58.92	11.478	23 41 3.9	34.01
Dec. 1	19 56 56.41	11.395	23 29 5.5	35.19	1 3 14.4	19 57 33.30	11.387	23 27 11.2	35.39
2	20 1 28.78	11.302	23 14 45.0	36.53	2 3 15.0	20 2 5.48	11.294	23 12 46.0	36.72
3	20 5 58.91	11.207	22 59 52.5	37.84	3 3 15.5	20 6 35.41	11.198	22 57 48.8	38.03
4	20 10 26.72	11.110	22 44 28.8	39.12	4 3 16.0	20 11 3.00	11.100	22 42 20.7	39.30
5	20 14 52.17	11.010	22 28 34.7	40.37	5 3 16.5	20 15 28.21	10.999	22 26 22.2	40.55
6	20 19 15.20	10.908	22 12 11.1	41.59	6 3 16.9	20 19 50.98	10.896	22 9 54.4	41.77
7	20 23 35.73	10.803	21 55 18.8	42.77	7 3 17.3	20 24 11.23	10.791	21 52 57.9	42.94
8	20 27 53.71	10.695	21 37 58.6	43.91	8 3 17.7	20 28 28.92	10.682	21 35 33.7	44.07
9	20 32 9.07	10.585	21 20 11.5	45.01	9 3 18.0	20 32 43.97	10.571	21 17 42.7	45.16
10	20 36 21.75	10.472	21 1 58.3	46.08	10 3 18.3	20 36 56.32	10.458	20 59 25.8	46.23
11	20 40 31.69	10.357	20 43 20.0	47.11	11 3 18.5	20 41 5.92	10.342	20 40 44.0	47.25
12	20 44 38.84	10.239	20 24 17.4	48.10	12 3 18.7	20 45 12.71	10.223	20 21 38.0	48.24
13	20 48 43.13	10.119	20 4 51.6	49.05	13 3 18.8	20 49 16.62	10.102	20 2 8.9	49.18
14	20 52 44.50	9.996	19 45 3.4	49.96	14 3 18.9	20 53 17.59	9.979	19 42 17.6	50.08
15	20 56 42.90	9.871	19 24 53.9	50.83	15 3 18.9	20 57 15.58	9.853	19 22 5.2	50.94
16	21 0 38.27	9.743	19 4 24.0	51.66	16 3 18.9	21 1 10.52	9.725	19 1 32.6	51.77
17	21 4 30.53	9.613	18 43 34.7	52.44	17 3 18.8	21 5 2.34	9.594	18 40 40.7	52.54
18	21 8 19.64	9.480	18 22 27.0	53.19	18 3 18.7	21 8 50.99	9.460	18 19 30.7	53.28
19	21 12 5.55	9.345	18 1 1.7	53.90	19 3 18.5	21 12 36.43	9.325	17 58 3.2	53.98
20	21 15 48.19	9.208	17 39 19.9	54.57	20 3 18.3	21 16 18.58	9.187	17 36 19.4	54.64
21	21 19 27.50	9.068	17 17 22.6	55.20	21 3 18.0	21 19 57.37	9.046	17 14 20.4	55.27
22	21 23 3.43	8.926	16 55 10.8	55.78	22 3 17.6	21 23 32.86	8.904	16 52 7.0	55.84
23	21 26 35.92	8.781	16 32 45.6	56.32	23 3 17.2	21 27 4.75	8.758	16 29 40.4	56.37
24	21 30 4.90	8.633	16 10 8.0	56.81	24 3 16.7	21 30 33.18	8.609	16 7 1.6	56.85
25	21 33 30.30	8.482	15 47 18.9	57.27	25 3 16.2	21 33 58.01	8.458	15 44 11.5	57.30
26	21 36 52.06	8.329	15 24 19.4	57.68	26 3 15.6	21 37 19.17	8.304	15 21 11.2	57.70
27	21 40 10.10	8.173	15 1 10.5	58.05	27 3 15.0	21 40 36.63	8.147	14 58 1.8	58.06
28	21 43 24.35	8.014	14 37 53.4	58.37	28 3 14.3	21 43 50.27	7.987	14 34 44.4	58.38
29	21 46 34.72	7.851	14 14 29.0	58.65	29 3 13.5	21 46 59.99	7.824	14 11 19.8	58.65
30	21 49 41.13	7.684	13 50 58.5	58.88	30 3 12.6	21 50 5.75	7.656	13 47 49.4	58.86
31	21 52 43.49	7.513	13 27 23.2	59.06	31 3 11.7	21 53 7.46	7.485	13 24 14.5	59.03
32	21 55 41.71	+ 7.338	-13 3 44.1	+59.19	32 3 10.7	21 56 4.99	+ 7.309	-13 0 36.0	+59.15

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	15 14 32.80	+6.563	−17 23 48.3	−26.96	0 20 31.6	15 16 47.64	+6.569	−17 32 58.9	−26.67
1	15 17 10.49	6.578	17 34 31.4	26.64	1 20 30.3	15 19 25.49	6.584	17 43 34.9	26.34
2	15 19 48.52	6.592	17 45 6.9	26.32	2 20 29.0	15 22 3.66	6.598	17 54 3.3	26.02
3	15 22 26.89	6.606	17 55 34.8	26.00	3 20 27.7	15 24 42.18	6.612	18 4 23.9	25.70
4	15 25 5.61	6.620	18 5 54.9	25.67	4 20 26.4	15 27 21.05	6.626	18 14 36.8	25.37
5	15 27 44.66	6.634	18 16 7.1	25.34	5 20 25.1	15 30 0.25	6.640	18 24 41.7	25.04
6	15 30 24.05	6.649	18 26 11.3	25.01	6 20 23.8	15 32 39.78	6.654	18 34 38.5	24.69
7	15 33 3.78	6.663	18 36 7.4	24.67	7 20 22.5	15 35 19.66	6.669	18 44 27.1	24.35
8	15 35 43.85	6.676	18 45 55.3	24.32	8 20 21.3	15 37 59.87	6.683	18 54 7.3	24.00
9	15 38 24.25	6.689	18 55 34.8	23.97	9 20 20.0	15 40 40.41	6.696	19 3 39.2	23.65
10	15 41 4.98	6.703	19 5 5.9	23.62	10 20 18.7	15 43 21.28	6.709	19 13 2.7	23.29
11	15 43 46.04	6.717	19 14 28.6	23.26	11 20 17.5	15 46 2.47	6.723	19 22 17.5	22.94
12	15 46 27.42	6.730	19 23 42.6	22.90	12 20 16.2	15 48 43.97	6.736	19 31 23.6	22.57
13	15 49 9.11	6.743	19 32 47.9	22.54	13 20 15.0	15 51 25.79	6.749	19 40 21.0	22.21
14	15 51 51.12	6.756	19 41 44.3	22.17	14 20 13.7	15 54 7.91	6.761	19 49 9.7	21.84
15	15 54 33.42	6.769	19 50 32.0	21.80	15 20 12.5	15 56 50.33	6.774	19 57 49.3	21.46
16	15 57 16.03	6.782	19 59 10.6	21.42	16 20 11.3	15 59 33.04	6.786	20 6 19.8	21.08
17	15 59 58.93	6.794	20 7 40.1	21.04	17 20 10.1	16 2 16.06	6.799	20 14 41.3	20.70
18	16 2 42.13	6.806	20 16 0.6	20.65	18 20 8.9	16 4 59.36	6.811	20 22 53.7	20.32
19	16 5 25.62	6.818	20 24 11.9	20.27	19 20 7.6	16 7 42.96	6.822	20 30 56.7	19.93
20	16 8 9.40	6.829	20 32 13.8	19.88	20 20 6.4	16 10 26.84	6.834	20 38 50.3	19.54
21	16 10 53.47	6.841	20 40 6.3	19.49	21 20 5.2	16 13 11.01	6.846	20 46 34.7	19.15
22	16 13 37.82	6.854	20 47 49.4	19.10	22 20 4.0	16 15 55.46	6.858	20 54 9.4	18.75
23	16 16 22.46	6.866	20 55 23.0	18.70	23 20 2.8	16 18 40.19	6.869	21 1 34.7	18.35
24	16 19 7.37	6.877	21 2 47.1	18.29	24 20 1.6	16 21 25.19	6.881	21 8 50.3	17.95
25	16 21 52.55	6.889	21 10 1.5	17.90	25 20 0.5	16 24 10.46	6.892	21 15 56.3	17.55
26	16 24 38.01	6.900	21 17 6.2	17.49	26 19 59.3	16 26 56.00	6.903	21 22 52.6	17.14
27	16 27 23.73	6.911	21 24 1.2	17.08	27 19 58.1	16 29 41.81	6.915	21 29 39.1	16.73
28	16 30 9.72	6.922	21 30 46.4	16.68	28 19 56.9	16 32 27.89	6.926	21 36 15.7	16.32
29	16 32 55.98	6.933	21 37 21.6	16.26	29 19 55.8	16 35 14.23	6.936	21 42 42.3	15.90
30	16 35 42.50	6.943	21 43 46.9	15.84	30 19 54.6	16 38 0.83	6.946	21 48 59.0	15.49
31	16 38 29.27	6.954	21 50 2.2	15.43	31 19 53.4	16 40 47.68	6.956	21 55 5.6	15.07
Feb. 1	16 41 16.30	6.964	21 56 7.4	15.01	1 19 52.3	16 43 34.77	6.967	22 1 2.1	14.64
2	16 44 3.57	6.974	22 2 2.4	14.58	2 19 51.1	16 46 22.10	6.977	22 6 48.4	14.22
3	16 46 51.08	6.984	22 7 47.2	14.15	3 19 50.0	16 49 9.67	6.986	22 12 24.4	13.79
4	16 49 38.81	6.993	22 13 21.7	13.72	4 19 48.8	16 51 57.46	6.995	22 17 50.2	13.35
5	16 52 26.77	7.003	22 18 45.9	13.29	5 19 47.7	16 54 45.46	7.004	22 23 5.5	12.92
6	16 55 14.94	7.012	22 23 59.6	12.86	6 19 46.6	16 57 33.67	7.013	22 28 10.5	12.48
7	16 58 3.32	7.020	22 29 3.0	12.42	7 19 45.4	17 0 22.08	7.021	22 33 4.9	12.04
8	17 0 51.89	7.027	22 33 55.8	11.98	8 19 44.3	17 3 10.67	7.028	22 37 48.6	11.60
9	17 3 40.64	7.035	22 38 38.0	11.54	9 19 43.2	17 5 59.43	7.035	22 42 21.8	11.16
10	17 6 29.56	7.042	22 43 9.5	11.09	10 19 42.1	17 8 48.36	7.042	22 46 44.4	10.72
11	17 9 18.65	7.049	22 47 30.3	10.64	11 19 40.9	17 11 37.44	7.048	22 50 56.3	10.28
12	17 12 7.89	7.055	22 51 40.5	10.20	12 19 39.8	17 14 26.66	7.054	22 54 57.5	9.83
13	17 14 57.27	7.061	22 55 40.0	9.75	13 19 38.7	17 17 16.02	7.059	22 58 48.1	9.38
14	17 17 46.78	7.065	22 59 28.8	9.31	14 19 37.6	17 20 5.51	7.064	23 2 27.9	8.93
15	17 20 36.42	7.070	23 3 6.8	8.86	15 19 36.5	17 22 55.11	7.068	23 5 56.9	8.48
16	17 23 26.18	7.075	23 6 34.0	8.40	16 19 35.4	17 25 44.82	7.073	23 9 15.0	8.03
17	17 26 16.04	7.079	23 9 50.3	7.95	17 19 34.3	17 28 34.63	7.077	23 12 22.3	7.58
18	17 29 6.00	7.083	23 12 55.7	7.50	18 19 33.2	17 31 24.53	7.081	23 15 18.9	7.13
19	17 31 56.05	7.087	23 15 50.4	7.05	19 19 32.1	17 34 14.52	7.084	23 18 4.6	6.68
20	17 34 46.19	7.090	23 18 34.2	6.60	20 19 30.9	17 37 4.58	7.087	23 20 39.4	6.22
21	17 37 36.40	7.093	23 21 7.1	6.14	21 19 29.8	17 39 54.72	7.090	23 23 3.4	5.77
22	17 40 26.69	7.096	23 23 29.2	5.69	22 19 28.7	17 42 44.93	7.093	23 25 16.5	5.32
23	17 43 17.04	7.098	23 25 40.4	5.24	23 19 27.6	17 45 35.21	7.096	23 27 18.8	4.87
24	17 46 7.45	7.101	23 27 40.8	4.79	24 19 26.5	17 48 25.54	7.098	23 29 10.3	4.41
25	17 48 57.91	7.103	23 29 30.2	4.34	25 19 25.4	17 51 15.91	7.099	23 30 50.9	3.96
26	17 51 48.43	7.105	23 31 8.8	3.88	26 19 24.3	17 54 6.32	7.101	23 32 20.6	3.50
27	17 54 38.98	7.107	23 32 36.5	3.42	27 19 23.2	17 56 56.77	7.102	23 33 39.3	3.04
28	17 57 29.57	7.108	23 33 53.2	2.97	28 19 22.1	17 59 47.25	7.104	23 34 47.1	2.59
29	18 0 20.18	+7.109	−23 34 59.0	− 2.51	29 19 21.0	18 2 37.75	+7.104	−23 35 44.0	− 2.14

Date. 1877.	FOR WASHINGTON MEAN NOON. Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	FOR MERIDIAN TRANSIT. Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	18 0 20.18	+7.109	-23 34 59.0	- 2.51	1 19 21.0	18 2 37.75	+7.104	-23 35 44.0	- 2.14
2	18 3 10.80	7.109	23 35 53.9	2.06	2 19 19.9	18 5 28.24	7.103	23 36 30.1	1.69
3	18 6 1.42	7.109	23 36 37.8	1.61	3 19 18.8	18 8 18.72	7.103	23 37 5.2	1.23
4	18 8 52.03	7.108	23 37 10.8	1.16	4 19 17.7	18 11 9.19	7.102	23 37 29.5	0.78
5	18 11 42.63	7.107	23 37 33.0	0.70	5 19 16.6	18 13 59.63	7.101	23 37 42.9	- 0.34
6	18 14 33.19	7.106	23 37 44.3	- 0.25	6 19 15.5	18 16 50.03	7.099	23 37 45.5	+ 0.12
7	18 17 23.72	7.104	23 37 44.8	+ 0.20	7 19 14.4	18 19 40.38	7.096	23 37 37.3	0.57
8	18 20 14.18	7.102	23 37 34.5	0.65	8 19 13.3	18 22 30.67	7.093	23 37 18.3	1.01
9	18 23 4.58	7.099	23 37 13.4	1.10	9 19 12.2	18 25 20.88	7.090	23 36 48.7	1.46
10	18 25 54.89	7.094	23 36 41.6	1.55	10 19 11.1	18 28 10.98	7.086	23 36 8.3	1.90
11	18 28 45.11	7.089	23 35 59.0	1.99	11 19 10.0	18 31 0.97	7.081	23 35 17.3	2.34
12	18 31 35.21	7.085	23 35 5.8	2.44	12 19 8.9	18 33 50.85	7.075	23 34 15.7	2.79
13	18 34 25.20	7.079	23 34 2.0	2.88	13 19 7.8	18 36 40.60	7.070	23 33 3.5	3.23
14	18 37 15.05	7.074	23 32 47.6	3.32	14 19 6.7	18 39 30.22	7.064	23 31 40.8	3.67
15	18 40 4.77	7.068	23 31 22.6	3.76	15 19 5.6	18 42 19.68	7.058	23 30 7.6	4.10
16	18 42 54.33	7.062	23 29 47.3	4.19	16 19 4.5	18 45 8.97	7.051	23 28 24.1	4.52
17	18 45 43.72	7.054	23 28 1.6	4.61	17 19 3.3	18 47 58.08	7.043	23 26 30.3	4.95
18	18 48 32.92	7.046	23 26 5.6	5.04	18 19 2.2	18 50 47.00	7.035	23 24 26.3	5.38
19	18 51 21.94	7.038	23 23 59.4	5.47	19 19 1.1	18 53 35.73	7.026	23 22 12.1	5.80
20	18 54 10.76	7.030	23 21 42.9	5.89	20 19 0.0	18 56 24.26	7.018	23 19 47.8	6.22
21	18 56 59.38	7.022	23 19 16.4	6.31	21 18 58.8	18 59 12.58	7.009	23 17 13.4	6.64
22	18 59 47.79	7.013	23 16 39.8	6.73	22 18 57.7	19 2 0.70	7.000	23 14 29.1	7.05
23	19 2 36.00	7.004	23 13 53.3	7.14	23 18 56.5	19 4 48.60	6.991	23 11 34.9	7.46
24	19 5 23.99	6.995	23 10 56.9	7.56	24 18 55.4	19 7 36.28	6.982	23 8 30.8	7.88
25	19 8 11.76	6.985	23 7 50.5	7.97	25 18 54.3	19 10 23.74	6.972	23 5 16.8	8.28
26	19 10 59.29	6.975	23 4 34.3	8.37	26 18 53.1	19 13 10.96	6.962	23 1 53.2	8.68
27	19 13 46.59	6.965	23 1 8.5	8.78	27 18 51.9	19 15 57.93	6.951	22 58 20.0	9.09
28	19 16 33.64	6.954	22 57 33.0	9.18	28 18 50.8	19 18 44.64	6.940	22 54 37.2	9.48
29	19 19 20.43	6.944	22 53 47.9	9.57	29 18 49.6	19 21 31.10	6.930	22 50 44.8	9.88
30	19 22 6.96	6.934	22 49 53.4	9.97	30 18 48.5	19 24 17.29	6.919	22 46 43.0	10.27
31	19 24 53.23	6.923	22 45 49.4	10.36	31 18 47.3	19 27 3.20	6.907	22 42 32.0	10.64
Apr. 1	19 27 39.21	6.910	22 41 36.2	10.74	1 18 46.1	19 29 48.82	6.894	22 38 11.8	11.03
2	19 30 24.90	6.898	22 37 13.8	11.12	2 18 44.9	19 32 34.14	6.882	22 33 42.5	11.41
3	19 33 10.29	6.885	22 32 42.3	11.50	3 18 43.7	19 35 19.15	6.869	22 29 4.2	11.78
4	19 35 55.36	6.871	22 28 1.8	11.87	4 18 42.5	19 38 3.84	6.855	22 24 17.0	12.15
5	19 38 40.11	6.857	22 23 12.5	12.24	5 18 41.3	19 40 48.20	6.841	22 19 21.1	12.51
6	19 41 24.52	6.843	22 18 14.3	12.60	6 18 40.1	19 43 32.20	6.825	22 14 16.6	12.87
7	19 44 8.58	6.828	22 13 7.6	12.96	7 18 38.9	19 46 15.83	6.810	22 9 3.6	13.22
8	19 46 52.28	6.812	22 7 52.4	13.31	8 18 37.7	19 48 59.08	6.794	22 3 42.1	13.56
9	19 49 35.59	6.796	22 2 28.9	13.65	9 18 36.5	19 51 41.94	6.778	21 58 12.4	13.90
10	19 52 18.50	6.780	21 56 57.1	13.99	10 18 35.2	19 54 24.40	6.761	21 52 34.7	14.24
11	19 55 1.01	6.763	21 51 17.3	14.33	11 18 34.0	19 57 6.45	6.744	21 46 48.9	14.57
12	19 57 43.11	6.745	21 45 29.4	14.66	12 18 32.8	19 59 48.09	6.726	21 40 55.3	14.89
13	20 0 24.79	6.727	21 39 33.7	14.98	13 18 31.5	20 2 29.30	6.708	21 34 54.0	15.21
14	20 3 6.04	6.709	21 33 30.4	15.30	14 18 30.2	20 5 10.07	6.689	21 28 45.1	15.53
15	20 5 46.85	6.691	21 27 19.5	15.61	15 18 29.0	20 7 50.40	6.671	21 22 28.8	15.83
16	20 8 27.22	6.672	21 21 1.2	15.91	16 18 27.7	20 10 30.28	6.652	21 16 5.2	16.13
17	20 11 7.14	6.653	21 14 35.6	16.21	17 18 26.4	20 13 9.69	6.633	21 9 34.6	16.42
18	20 13 46.58	6.633	21 8 3.0	16.51	18 18 25.1	20 15 48.64	6.613	21 2 57.0	16.71
19	20 16 25.57	6.614	21 1 23.4	16.80	19 18 23.8	20 18 27.12	6.593	20 56 12.5	16.99
20	20 19 4.07	6.594	20 54 37.0	17.07	20 18 22.5	20 21 5.13	6.574	20 49 21.3	17.27
21	20 21 42.12	6.575	20 47 43.9	17.35	21 18 21.2	20 23 42.66	6.554	20 42 23.5	17.54
22	20 24 19.68	6.555	20 40 44.3	17.62	22 18 19.9	20 26 19.71	6.534	20 35 19.3	17.81
23	20 26 56.77	6.535	20 33 38.1	17.89	23 18 18.6	20 28 56.28	6.513	20 28 8.7	18.07
24	20 29 33.36	6.514	20 26 25.6	18.15	24 18 17.2	20 31 32.35	6.492	20 20 51.9	18.33
25	20 32 9.46	6.494	20 19 6.9	18.40	25 18 15.9	20 34 7.91	6.472	20 13 28.9	18.58
26	20 34 45.06	6.473	20 11 42.1	18.65	26 18 14.5	20 36 43.00	6.451	20 6 0.1	18.82
27	20 37 20.16	6.452	20 4 11.5	18.89	27 18 13.1	20 39 17.57	6.430	19 58 25.6	19.06
28	20 39 54.75	6.431	19 56 35.3	19.13	28 18 11.8	20 41 51.61	6.408	19 50 45.6	19.29
29	20 42 28.81	6.409	19 48 53.4	19.36	29 18 10.4	20 44 25.12	6.385	19 43 0.0	19.50
30	20 45 2.35	6.386	19 41 6.1	19.58	30 18 9.0	20 46 58.09	6.362	19 35 9.2	19.72
31	20 47 35.33	+6.363	-19 33 13.6	+19.79	31 18 7.6	20 49 30.51	+6.339	-19 27 13.3	+19.93

MARS. 1877.

Date.	FOR WASHINGTON MEAN NOON.								FOR MERIDIAN TRANSIT.										
1877.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Mean Time of Transit.			Apparent Right Ascension.			Diff. for 1 h. of Long.	Apparent Declination.			Diff. for 1 hour of Long.
	h	m	s	s	°	′	″	″	d	h	m	h	m	s	s	°	′	″	″
May 1	20	47	35.33	+6.363	-19	33	13.6	+19.79	1	18	7.6	20	49	30.51	+6.339	-19	27	13.3	+19.93
2	20	50	7.77	6.339	19	25	16.1	20.00	2	18	6.2	20	52	2.36	6.315	19	19	12.6	20.13
3	20	52	39.62	6.315	19	17	13.8	20.19	3	18	4.8	20	54	33.64	6.291	19	11	7.3	20.31
4	20	55	10.90	6.291	19	9	6.9	20.38	4	18	3.4	20	57	4.33	6.266	19	2	57.6	20.50
5	20	57	41.59	6.266	19	0	55.6	20.56	5	18	1.9	20	59	34.42	6.241	18	54	43.5	20.67
6	21	0	11.68	6.241	18	52	40.0	20.73	6	18	0.5	21	2	3.90	6.215	18	46	25.4	20.83
7	21	2	41.15	6.214	18	44	20.4	20.89	7	17	59.0	21	4	32.76	6.189	18	38	3.4	20.99
8	21	5	10.01	6.188	18	35	56.9	21.05	8	17	57.5	21	7	0.99	6.163	18	29	37.7	21.14
9	21	7	38.22	6.162	18	27	29.8	21.20	9	17	56.1	21	9	28.57	6.135	18	21	8.6	21.28
10	21	10	5.79	6.135	18	18	59.3	21.34	10	17	54.6	21	11	55.48	6.107	18	12	36.3	21.41
11	21	12	32.68	6.106	18	10	25.6	21.46	11	17	53.1	21	14	21.70	6.079	18	4	1.0	21.53
12	21	14	58.89	6.077	18	1	49.1	21.58	12	17	51.6	21	16	47.23	6.050	17	55	23.0	21.63
13	21	17	24.46	6.049	17	53	9.9	21.69	13	17	50.0	21	19	12.08	6.021	17	46	42.6	21.74
14	21	19	49.22	6.019	17	44	28.2	21.79	14	17	48.5	21	21	36.21	5.990	17	37	59.5	21.84
15	21	22	13.32	5.989	17	35	44.1	21.88	15	17	47.0	21	23	59.62	5.960	17	29	14.4	21.92
16	21	24	36.70	5.959	17	26	57.9	21.96	16	17	45.4	21	26	22.31	5.930	17	20	27.4	22.00
17	21	26	59.36	5.929	17	18	9.8	22.04	17	17	43.8	21	28	44.28	5.900	17	11	38.5	22.07
18	21	29	21.29	5.899	17	9	19.8	22.11	18	17	42.2	21	31	5.52	5.870	17	2	47.9	22.13
19	21	31	42.49	5.868	17	0	28.3	22.17	19	17	40.6	21	33	26.03	5.839	16	53	55.9	22.19
20	21	34	2.96	5.837	16	51	35.4	22.23	20	17	39.0	21	35	45.79	5.808	16	45	2.7	22.24
21	21	36	22.68	5.806	16	42	41.3	22.27	21	17	37.4	21	38	4.79	5.776	16	36	8.5	22.28
22	21	38	41.62	5.774	16	33	46.2	22.31	22	17	35.8	21	40	23.01	5.743	16	27	13.4	22.31
23	21	40	59.80	5.741	16	24	50.4	22.34	23	17	34.1	21	42	40.46	5.710	16	18	17.7	22.33
24	21	43	17.19	5.708	16	15	53.9	22.36	24	17	32.5	21	44	57.12	5.678	16	9	21.5	22.35
25	21	45	33.80	5.676	16	6	57.0	22.37	25	17	30.8	21	47	12.99	5.645	16	0	25.0	22.36
26	21	47	49.61	5.642	15	57	59.9	22.38	26	17	29.1	21	49	28.06	5.610	15	51	28.4	22.35
27	21	50	4.61	5.608	15	49	2.7	22.37	27	17	27.4	21	51	42.30	5.576	15	42	32.1	22.33
28	21	52	18.79	5.573	15	40	5.9	22.35	28	17	25.7	21	53	55.71	5.541	15	33	36.3	22.31
29	21	54	32.12	5.538	15	31	9.7	22.33	29	17	24.0	21	56	8.27	5.505	15	24	41.1	22.28
30	21	56	44.59	5.502	15	22	14.1	22.30	30	17	22.2	21	58	19.95	5.468	15	15	46.9	22.23
31	21	58	56.20	5.465	15	13	19.5	22.24	31	17	20.4	22	0	30.74	5.431	15	6	54.0	22.17
June 1	22	1	6.90	5.427	15	4	26.3	22.17	1	17	18.7	22	2	40.63	5.392	14	58	2.7	22.10
2	22	3	16.69	5.388	14	55	34.8	22.10	2	17	16.9	22	4	49.58	5.352	14	49	13.1	22.02
3	22	5	25.53	5.348	14	46	45.2	22.02	3	17	15.1	22	6	57.57	5.312	14	40	25.6	21.93
4	22	7	33.41	5.308	14	37	57.6	21.93	4	17	13.3	22	9	4.58	5.271	14	31	40.4	21.83
5	22	9	40.30	5.266	14	29	12.5	21.83	5	17	11.4	22	11	10.59	5.229	14	22	58.0	21.71
6	22	11	46.18	5.223	14	20	30.2	21.70	6	17	9.6	22	13	15.58	5.186	14	14	18.4	21.58
7	22	13	51.03	5.180	14	11	50.8	21.57	7	17	7.7	22	15	19.51	5.142	14	5	42.2	21.44
8	22	15	54.82	5.136	14	3	14.9	21.42	8	17	5.8	22	17	22.37	5.097	13	57	9.5	21.28
9	22	17	57.54	5.090	13	54	42.6	21.26	9	17	3.9	22	19	24.14	5.050	13	48	40.6	21.12
10	22	19	59.15	5.044	13	46	14.3	21.10	10	17	2.0	22	21	24.79	5.003	13	40	15.8	20.94
11	22	21	59.63	4.996	13	37	50.0	20.92	11	17	0.0	22	23	24.30	4.955	13	31	55.3	20.75
12	22	23	58.96	4.947	13	29	30.1	20.72	12	16	58.1	22	25	22.64	4.907	13	23	39.6	20.55
13	22	25	57.12	4.899	13	21	15.1	20.52	13	16	56.1	22	27	19.81	4.858	13	15	28.9	20.34
14	22	27	54.11	4.849	13	13	5.1	20.31	14	16	54.1	22	29	15.79	4.808	13	7	23.2	20.13
15	22	29	49.89	4.799	13	5	0.2	20.09	15	16	52.1	22	31	10.56	4.756	12	59	22.8	19.90
16	22	31	44.45	4.747	12	57	0.7	19.86	16	16	50.0	22	33	4.10	4.704	12	51	27.8	19.67
17	22	33	37.77	4.695	12	49	6.7	19.62	17	16	48.0	22	34	56.36	4.651	12	43	38.5	19.43
18	22	35	29.82	4.642	12	41	18.6	19.37	18	16	45.9	22	36	47.34	4.597	12	35	55.1	19.18
19	22	37	20.58	4.587	12	33	36.5	19.12	19	16	43.8	22	38	37.02	4.543	12	28	18.1	18.90
20	22	39	10.03	4.532	12	26	0.8	18.85	20	16	41.6	22	40	25.37	4.487	12	20	47.8	18.62
21	22	40	58.14	4.476	12	18	31.9	18.56	21	16	39.5	22	42	12.37	4.430	12	13	24.3	18.33
22	22	42	44.89	4.419	12	11	9.9	18.26	22	16	37.3	22	43	58.01	4.372	12	6	7.8	18.04
23	22	44	30.26	4.361	12	3	55.0	17.96	23	16	35.1	22	45	42.25	4.313	11	58	58.6	17.73
24	22	46	14.21	4.301	11	56	47.6	17.65	24	16	32.9	22	47	25.06	4.253	11	51	57.1	17.40
25	22	47	56.72	4.240	11	49	47.8	17.32	25	16	30.6	22	49	6.41	4.191	11	45	3.5	17.06
26	22	49	37.76	4.179	11	42	56.1	16.98	26	16	28.4	22	50	46.25	4.128	11	38	18.0	16.71
27	22	51	17.28	4.115	11	36	12.6	16.63	27	16	26.1	22	52	24.55	4.063	11	31	41.0	16.35
28	22	52	55.25	4.049	11	29	37.7	16.26	28	16	23.7	22	54	1.27	3.996	11	25	13.1	15.97
29	22	54	31.62	3.981	11	23	12.1	15.87	29	16	21.4	22	55	36.37	3.928	11	18	54.5	15.58
30	22	56	6.35	3.912	11	16	55.9	15.47	30	16	19.0	22	57	9.81	3.858	11	12	45.4	15.17
31	22	57	39.40	+3.841	-11	10	49.3	+15.06	31	16	16.6	22	58	41.55	+3.786	-11	6	46.2	+14.75

Date.		FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
		h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July	1	22 57 39.40	+3.841	-11 10 49.3	+15.06	1 16 16.6	22 58 41.55	+3.786	-11 6 46.2	+14.75
	2	22 59 10.73	3.769	11 4 52.9	14.64	2 16 14.1	23 0 11.54	3.713	11 0 57.2	14.32
	3	23 0 40.30	3.694	10 59 6.6	14.20	3 16 11.7	23 1 39.73	3.637	10 55 18.9	13.86
	4	23 2 8.05	3.617	10 53 31.2	13.74	4 16 9.2	23 3 6.07	3.559	10 49 51.8	13.39
	5	23 3 33.93	3.539	10 48 7.1	13.26	5 16 6.7	23 4 30.53	3.479	10 44 36.2	12.91
	6	23 4 57.91	3.458	10 42 54.6	12.78	6 16 4.1	23 5 53.05	3.397	10 39 32.1	12.42
	7	23 6 19.93	3.375	10 37 53.8	12.28	7 16 1.5	23 7 13.59	3.313	10 34 39.8	11.92
	8	23 7 39.94	3.291	10 33 5.1	11.78	8 15 58.9	23 8 32.09	3.227	10 29 59.6	11.41
	9	23 8 57.89	3.204	10 28 28.8	11.25	9 15 56.2	23 9 48.51	3.140	10 25 32.0	10.88
	10	23 10 13.75	3.116	10 24 4.9	10.72	10 15 53.5	23 11 2.80	3.051	10 21 17.1	10.35
	11	23 11 27.47	3.026	10 19 53.9	10.18	11 15 50.8	23 12 14.94	2.960	10 17 15.2	9.80
	12	23 12 39.01	2.935	10 15 56.0	9.63	12 15 48.0	23 13 24.89	2.868	10 13 26.5	9.25
	13	23 13 48.32	2.841	10 12 11.4	9.07	13 15 45.2	23 14 32.61	2.774	10 9 51.3	8.68
	14	23 14 55.38	2.746	10 8 40.4	8.50	14 15 42.3	23 15 38.04	2.678	10 6 29.8	8.11
	15	23 16 0.14	2.650	10 5 23.2	7.92	15 15 39.5	23 16 41.15	2.580	10 3 22.1	7.53
	16	23 17 2.56	2.551	10 2 19.9	7.34	16 15 36.6	23 17 41.90	2.481	10 0 28.2	6.95
	17	23 18 2.60	2.451	9 59 30.6	6.76	17 15 33.6	23 18 40.25	2.381	9 57 48.3	6.37
	18	23 19 0.22	2.349	9 56 55.4	6.17	18 15 30.6	23 19 36.18	2.279	9 55 22.6	5.77
	19	23 19 55.39	2.246	9 54 34.5	5.57	19 15 27.6	23 20 29.62	2.174	9 53 11.2	5.17
	20	23 20 48.05	2.141	9 52 28.0	4.96	20 15 24.5	23 21 20.53	2.067	9 51 14.5	4.55
	21	23 21 38.15	2.034	9 50 36.4	4.34	21 15 21.4	23 22 8.87	1.960	9 49 32.6	3.93
	22	23 22 25.67	1.925	9 48 59.6	3.71	22 15 18.2	23 22 54.61	1.850	9 48 5.7	3.30
	23	23 23 10.55	1.814	9 47 38.0	3.09	23 15 15.0	23 23 37.69	1.739	9 46 53.9	2.67
	24	23 23 52.74	1.701	9 46 31.5	2.45	24 15 11.7	23 24 18.07	1.625	9 45 57.3	2.04
	25	23 24 32.21	1.586	9 45 40.4	1.82	25 15 8.4	23 24 55.69	1.509	9 45 15.9	1.40
	26	23 25 8.89	1.470	9 45 4.6	1.17	26 15 5.0	23 25 30.52	1.392	9 44 50.0	0.75
	27	23 25 42.75	1.351	9 44 44.4	+ 0.52	27 15 1.6	23 26 2.52	1.273	9 44 39.6	+ 0.10
	28	23 26 13.75	1.231	9 44 39.9	- 0.14	28 14 58.2	23 26 31.62	1.151	9 44 44.9	- 0.56
	29	23 26 41.83	1.108	9 44 51.1	0.80	29 14 54.7	23 26 57.78	1.028	9 45 6.1	1.21
	30	23 27 6.94	0.983	9 55 18.4	1.47	30 14 51.1	23 27 20.97	0.903	9 45 43.2	1.87
	31	23 27 29.04	0.857	9 46 1.7	2.13	31 14 47.5	23 27 41.13	0.776	9 46 36.3	2.54
Aug.	1	23 27 48.07	0.728	9 47 1.1	2.80	1 14 43.9	23 27 58.21	0.647	9 47 45.4	3.20
	2	23 28 3.99	0.598	9 48 16.4	3.47	2 14 40.2	23 28 12.18	0.517	9 49 10.3	3.86
	3	23 28 16.78	0.467	9 49 47.6	4.13	3 14 36.5	23 28 23.01	0.386	9 50 50.8	4.51
	4	23 28 26.41	0.334	9 51 34.5	4.77	4 14 32.7	23 28 30.68	0.253	9 52 46.8	5.15
	5	23 28 32.85	0.202	9 53 36.9	5.41	5 14 28.8	23 28 35.18	+0.121	9 54 58.1	5.78
	6	23 28 36.10	+0.068	9 55 54.5	6.04	6 14 24.9	23 28 36.51	-0.011	9 57 24.4	6.40
	7	23 28 36.16	-0.064	9 58 27.1	6.66	7 14 20.9	23 28 34.67	0.143	10 0 5.4	7.00
	8	23 28 33.04	0.196	10 1 14.3	7.26	8 14 16.9	23 28 29.67	0.275	10 3 0.6	7.58
	9	23 28 26.71	0.329	10 4 15.6	7.84	9 14 12.8	23 28 21.49	0.407	10 6 9.6	8.15
	10	23 28 17.22	0.462	10 7 30.6	8.39	10 14 8.7	23 28 10.13	0.538	10 9 31.8	8.69
	11	23 28 4.54	0.593	10 10 58.7	8.93	11 14 4.5	23 27 55.64	0.668	10 13 6.6	9.21
	12	23 27 48.74	0.723	10 14 39.2	9.43	12 14 0.3	23 27 38.06	0.797	10 16 53.5	9.70
	13	23 27 29.83	0.851	10 18 31.7	9.92	13 13 56.1	23 27 17.42	0.923	10 20 51.9	10.16
	14	23 27 7.86	0.977	10 22 35.4	10.38	14 13 51.7	23 26 53.78	1.047	10 25 1.1	10.59
	15	23 26 42.89	1.101	10 26 49.7	10.79	15 13 47 4	23 26 27.19	1.168	10 29 20.2	10.98
	16	23 26 14.98	1.223	10 31 13.6	11.18	16 13 43.0	23 25 57 72	1.287	10 33 48.4	11.35
	17	23 25 44.18	1.341	10 35 46.3	11.53	17 13 38.5	23 25 25.42	1.403	10 38 25.0	11.68
	18	23 25 10.60	1.456	10 40 26.9	11.84	18 13 34.0	23 24 50.38	1.515	10 43 8.8	11.96
	19	23 24 34.27	1.568	10 45 14.5	12.12	19 13 29.4	23 24 12.68	1.625	10 47 59.0	12.21
	20	23 23 55.30	1.678	10 50 8.3	12.36	20 13 24.8	23 23 32.40	1.731	10 52 55.1	12.44
	21	23 23 13.76	1.783	10 55 7.8	12.58	21 13 20.2	23 22 49.60	1.833	10 57 56.4	12.64
	22	23 22 29.74	1.884	11 0 12.1	12.76	22 13 15.5	23 22 4.38	1.932	11 3 1.9	12.81
	23	23 21 43.35	1.980	11 5 20.3	12.91	23 13 10.8	23 21 16.87	2.025	11 8 11.0	12.93
	24	23 20 54.60	2.072	11 10 31.6	13.01	24 13 6.0	23 20 27.17	2.114	11 13 22.6	13.01
	25	23 20 3.87	2.160	11 15 45.0	13.08	25 13 1.2	23 19 35.39	2.198	11 18 35.6	13.06
	26	23 19 11.01	2.243	11 20 59.3	13.10	26 12 56.4	23 18 41.64	2.278	11 23 49.1	13.05
	27	23 18 16.21	2.320	11 26 13.7	13.08	27 12 51.5	23 17 46.06	2.351	11 29 1.9	13.00
	28	23 17 19.62	2.392	11 31 26.9	13.00	28 12 46.6	23 16 48.79	2.419	11 34 12.8	12.90
	29	23 16 21.39	2.457	11 36 37.7	12.88	29 12 41.7	23 15 49.95	2.481	11 39 20.9	12.76
	30	23 15 21.66	2.516	11 41 45.3	12.73	30 12 36.8	23 14 49.70	2.536	11 44 25.5	12.59
	31	23 14 20.61	-2.568	-11 46 48.7	-12.53	31 12 31.8	23 13 48.23	-2.583	-11 49 25.2	-12.37

MARS, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	23 13 18.39	-2.613	-11 51 46.8	-12.29	1 12 26.9	23 12 45.68	-2.625	-11 54 19.1	-12.10
2	23 12 15.17	2.651	11 56 38.5	12.00	2 12 21.9	23 11 42.24	2.659	11 59 6.0	11.79
3	23 11 11.14	2.681	12 1 22.6	11.66	3 12 16.9	23 10 38.10	2.684	12 3 44.7	11.42
4	23 10 6.48	2.703	12 5 57.9	11.26	4 12 11.9	23 9 33.41	2.701	12 8 14.1	11.01
5	23 9 1.38	2.717	12 10 23.3	10.83	5 12 6.9	23 8 28.39	2.711	12 12 33.3	10.56
6	23 7 56.05	2.723	12 14 37.8	10.36	6 12 1.9	23 7 23.26	2.712	12 16 41.1	10.07
7	23 6 50.67	2.720	12 18 40.4	9.84	7 11 56.8	23 6 18.20	2.705	12 20 36.4	9.53
8	23 5 45.46	2.709	12 22 30.2	9.29	8 11 51.8	23 5 13.38	2.691	12 24 18.5	8.96
9	23 4 40.62	2.690	12 26 6.2	8.69	9 11 46.8	23 4 9.01	2.669	12 27 46.7	8.36
10	23 3 36.34	2.663	12 29 27.5	8.06	10 11 41.8	23 3 5.29	2.638	12 30 59.9	7.72
11	23 2 32.81	2.627	12 32 33.3	7.39	11 11 36.8	23 2 2.41	2.599	12 33 57.2	7.03
12	23 1 30.22	2.584	12 35 22.5	6.70	12 11 31.9	23 1 0.54	2.553	12 36 37.7	6.33
13	23 0 28.74	2.535	12 37 54.7	5.98	13 11 26.9	22 59 59.86	2.500	12 39 1.1	5.61
14	22 59 28.56	2.478	12 40 9.4	5.24	14 11 22.0	22 59 0.55	2.439	12 41 6.9	4.87
15	22 58 29.82	2.414	12 42 6.2	4.47	15 11 17.1	22 58 2.75	2.373	12 42 54.7	4.11
16	22 57 32.69	2.344	12 43 44.4	3.70	16 11 12.3	22 57 6.61	2.301	12 44 23.8	3.32
17	22 56 37.31	2.268	12 45 3.8	2.92	17 11 7.4	22 56 12.28	2.223	12 45 34.1	2.53
18	22 55 43.82	2.187	12 46 4.2	2.11	18 11 2.6	22 55 19.88	2.141	12 46 25.4	1.74
19	22 54 52.33	2.101	12 46 45.3	1.31	19 10 57.8	22 54 29.51	2.054	12 46 57.6	0.94
20	22 54 2.96	2.011	12 47 7.2	- 0.51	20 10 53.1	22 53 41.29	1.962	12 47 10.5	- 0.14
21	22 53 15.81	1.916	12 47 9.6	+ 0.30	21 10 48.4	22 52 55.33	1.866	12 47 4.1	+ 0.66
22	22 52 30.99	1.817	12 46 52.6	1.11	22 10 43.8	22 52 11.73	1.766	12 46 38.4	1.47
23	22 51 48.59	1.714	12 46 16.0	1.92	23 10 39.1	22 51 30.58	1.662	12 45 53.3	2.28
24	22 51 8.69	1.608	12 45 19.9	2.74	24 10 34.6	22 50 51.95	1.556	12 44 48.7	3.10
25	22 50 31.38	1.500	12 44 4.3	3.55	25 10 30.0	22 50 15.89	1.447	12 43 24.8	3.90
26	22 49 56.72	1.388	12 42 29.3	4.36	26 10 25.5	22 49 42.49	1.334	12 41 41.7	4.70
27	22 49 24.76	1.274	12 40 35.0	5.17	27 10 21.1	22 49 11.82	1.219	12 39 39.4	5.50
28	22 48 55.59	1.157	12 38 21.3	5.96	28 10 16.7	22 48 43.95	1.102	12 37 18.0	6.28
29	22 48 29.25	1.038	12 35 48.7	6.75	29 10 12.4	22 48 18.92	0.983	12 34 37.8	7.06
30	22 48 5.79	0.917	12 32 57.2	7.53	30 10 8.1	22 47 56.76	0.863	12 31 38.9	7.84
Oct. 1	22 47 45.24	0.795	12 29 47.0	8.30	1 10 3.8	22 47 37.50	0.741	12 28 21.5	8.60
2	22 47 27.65	0.671	12 26 18.4	9.08	2 9 59.6	22 47 21.20	0.617	12 24 45.8	9.36
3	22 47 13.04	0.546	12 22 31.4	9.84	3 9 55.5	22 47 7.88	0.492	12 20 51.9	10.12
4	22 47 1.45	0.420	12 18 26.1	10.60	4 9 51.4	22 46 57.56	0.367	12 16 39.9	10.87
5	22 46 52.88	0.294	12 14 2.7	11.35	5 9 47.3	22 46 50.26	0.241	12 12 10.0	11.62
6	22 46 47.35	0.167	12 9 21.2	12.10	6 9 43.3	22 46 45.98	-0.115	12 7 22.2	12.36
7	22 46 44.86	-0.040	12 4 22.0	12.83	7 9 39.4	22 46 44.72	+0.011	12 2 16.8	13.09
8	22 46 45.43	+0.087	11 59 5.5	13.53	8 9 35.5	22 46 46.52	0.138	11 56 54.3	13.79
9	22 46 49.04	0.213	11 53 32.2	14.24	9 9 31.6	22 46 51.33	0.263	11 51 15.2	14.47
10	22 46 55.68	0.339	11 47 42.2	14.93	10 9 27.8	22 46 59.14	0.388	11 45 19.6	15.15
11	22 47 5.34	0.464	11 41 35.8	15.61	11 9 24.1	22 47 9.94	0.512	11 39 7.8	15.81
12	22 47 17.99	0.588	11 35 13.4	16.27	12 9 20.4	22 47 23.70	0.634	11 32 40.2	16.47
13	22 47 33.59	0.711	11 28 35.1	16.91	13 9 16.7	22 47 40.39	0.755	11 25 57.0	17.12
14	22 47 52.12	0.831	11 21 41.4	17.55	14 9 13.1	22 47 59.98	0.875	11 18 58.5	17.75
15	22 48 13.52	0.950	11 14 32.7	18.16	15 9 9.5	22 48 22.41	0.993	11 11 45.2	18.35
16	22 48 37.75	1.067	11 7 9.4	18.76	16 9 6.0	22 48 47.65	1.109	11 4 17.5	18.94
17	22 49 4.77	1.183	10 59 32.0	19.35	17 9 2.6	22 49 15.64	1.222	10 56 36.0	19.52
18	22 49 34.52	1.296	10 51 40.7	19.92	18 8 59.1	22 49 46.33	1.334	10 48 40.8	20.08
19	22 50 6.94	1.406	10 43 36.0	20.47	19 8 55.7	22 50 19.67	1.443	10 40 32.4	20.62
20	22 50 42.00	1.514	10 35 18.4	21.00	20 8 52.4	22 50 55.60	1.550	10 32 11.2	21.14
21	22 51 19.63	1.620	10 26 48.1	21.52	21 8 49.1	22 51 34.07	1.655	10 23 37.5	21.66
22	22 51 59.78	1.724	10 18 5.5	22.02	22 8 45.9	22 52 15.04	1.758	10 14 51.8	22.16
23	22 52 42.39	1.826	10 9 10.8	22.52	23 8 42.7	22 52 58.44	1.858	10 5 54.1	22.65
24	22 53 27.42	1.926	10 0 4.2	23.01	24 8 39.5	22 53 44.24	1.956	9 56 44.6	23.13
25	22 54 14.82	2.023	9 50 46.1	23.48	25 8 36.4	22 54 32.37	2.053	9 47 23.6	23.60
26	22 55 4.52	2.118	9 41 16.8	23.95	26 8 33.3	22 55 22.79	2.147	9 37 51.5	24.06
27	22 55 56.50	2.212	9 31 36.5	24.40	27 8 30.2	22 56 15.44	2.239	9 28 8.6	24.51
28	22 56 50.70	2.304	9 21 45.5	24.84	28 8 27.2	22 57 10.29	2.330	9 18 15.0	24.95
29	22 57 47.10	2.394	9 11 44.0	25.28	29 8 24.2	22 58 7.32	2.420	9 8 11.1	25.38
30	22 58 45.63	2.482	9 1 32.3	25.70	30 8 21.3	22 59 6.47	2.508	8 57 57.1	25.80
31	22 59 46.26	2.568	8 51 10.5	26.12	31 8 18.4	23 0 7.70	2.595	8 47 33.1	26.21
32	23 0 48.94	+2.653	- 8 40 38.7	+26.53	32 8 15.5	23 1 10.96	+2.678	- 8 36 59.2	+26.61

Date. 1877.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	23 0 48.94	+2.653	−8 40 38.7	+26.53	1 8 15.5	23 1 10.96	+2.678	−8 36 59.2	+26.61
2	23 1 53.63	2.736	8 29 57.3	26.92	2 8 12.6	23 2 16.21	2.759	8 26 15.8	27.00
3	23 3 0.29	2.817	8 19 6.3	27.32	3 8 9.8	23 3 23.41	2.839	8 15 22.9	27.40
4	23 4 8.89	2.897	8 8 5.8	27.71	4 8 7.0	23 4 32.51	2.917	8 4 20.5	27.79
5	23 5 19.37	2.975	7 56 56.1	28.09	5 8 4.2	23 5 43.48	2.994	7 53 9.0	28.16
6	23 6 31.70	3.052	7 45 37.4	28.45	6 8 1.5	23 6 56.29	3.070	7 41 48.6	28.53
7	23 7 45.84	3.126	7 34 10.0	28.82	7 7 58.8	23 8 10.89	3.144	7 30 19.6	28.88
8	23 9 1.74	3.198	7 22 34.1	29.17	8 7 56.2	23 9 27.23	3.216	7 18 42.2	29.23
9	23 10 19.36	3.269	7 10 49.9	29.51	9 7 53.6	23 10 45.26	3.286	7 6 56.6	29.57
10	23 11 38.65	3.337	6 58 57.5	29.84	10 7 51.0	23 12 4.94	3.354	6 55 2.9	29.90
11	23 12 59.56	3.404	6 46 57.3	30.17	11 7 48.4	23 13 26.22	3.420	6 43 1.5	30.22
12	23 14 22.05	3.469	6 34 49.5	30.48	12 7 45.8	23 14 49.06	3.484	6 30 52.6	30.53
13	23 15 46.06	3.532	6 22 34.2	30.78	13 7 43.3	23 16 13.42	3.546	6 18 36.3	30.83
14	23 17 11.57	3.593	6 10 11.7	31.08	14 7 40.8	23 17 39.25	3.606	6 6 12.8	31.11
15	23 18 38.53	3.653	5 57 42.4	31.36	15 7 38.3	23 19 6.51	3.665	5 53 42.6	31.39
16	23 20 6.91	3.711	5 45 6.5	31.63	16 7 35.8	23 20 35.17	3.722	5 41 5.9	31.67
17	23 21 36.65	3.767	5 32 24.1	31.89	17 7 33.4	23 22 5.18	3.778	5 28 22.8	31.92
18	23 23 7.72	3.821	5 19 35.5	32.14	18 7 31.0	23 23 36.50	3.831	5 15 33.6	32.17
19	23 24 40.07	3.874	5 6 41.0	32.40	19 7 28.6	23 25 9.09	3.883	5 2 38.5	32.42
20	23 26 13.67	3.925	4 53 40.5	32.64	20 7 26.2	23 26 42.91	3.934	4 49 37.5	32.66
21	23 27 48.47	3.975	4 40 34.3	32.88	21 7 23.9	23 28 17.93	3.983	4 36 31.0	32.89
22	23 29 24.46	4.023	4 27 22.6	33.10	22 7 21.5	23 29 54.12	4.031	4 23 18.8	33.12
23	23 31 1.59	4.070	4 14 5.6	33.31	23 7 19.2	23 31 31.44	4.078	4 10 1.5	33.33
24	23 32 39.84	4.117	4 0 43.4	33.52	24 7 16.9	23 33 9.87	4.124	3 56 39.1	33.54
25	23 34 19.19	4.162	3 47 16.2	33.73	25 7 14.6	23 34 49.39	4.169	3 43 11.7	33.74
26	23 35 59.61	4.206	3 33 44.2	33.94	26 7 12.4	23 36 29.97	4.212	3 29 39.5	33.94
27	23 37 41.08	4.249	3 20 7.3	34.14	27 7 10.1	23 38 11.59	4.255	3 16 2.5	34.14
28	23 39 23.57	4.291	3 6 25.6	34.33	28 7 7.9	23 39 54.23	4.297	3 2 20.7	34.33
29	23 41 7.07	4.332	2 52 39.4	34.51	29 7 5.7	23 41 37.86	4.338	2 48 34.4	34.51
30	23 42 51.55	4.373	2 38 49.0	34.69	30 7 3.5	23 43 22.47	4.379	2 34 44.0	34.69
Dec. 1	23 44 37.01	4.413	2 24 54.2	34.87	1 7 1.3	23 45 8.04	4.419	2 20 49.2	34.86
2	23 46 23.42	4.452	2 10 55.3	35.04	2 6 59.2	23 46 54.56	4.457	2 6 50.4	35.03
3	23 48 10.75	4.491	1 56 52.4	35.21	3 6 57.1	23 48 42.00	4.495	1 52 47.5	35.20
4	23 49 59.00	4.529	1 42 45.6	35.37	4 6 54.9	23 50 30.35	4.533	1 38 40.9	35.36
5	23 51 48.14	4.565	1 28 35.0	35.52	5 6 52.8	23 52 19.58	4.569	1 24 30.5	35.50
6	23 53 38.13	4.601	1 14 20.9	35.66	6 6 50.7	23 54 9.68	4.605	1 10 16.7	35.64
7	23 55 29.02	4.637	1 0 3.2	35.80	7 6 48.6	23 56 0.63	4.640	0 55 59.3	35.78
8	23 57 20.72	4.671	0 45 42.2	35.94	8 6 46.6	23 57 52.40	4.674	0 41 38.6	35.92
9	23 59 13.24	4.704	0 31 18.0	36.07	9 6 44.5	23 59 44.99	4.707	0 27 14.8	36.05
10	0 1 6.56	4.737	0 16 50.7	36.19	10 6 42.4	0 1 38.36	4.739	−0 12 47.9	36.17
11	0 3 0.64	4.769	−0 2 20.8	36.30	11 6 40.4	0 3 32.49	4.771	+0 1 41.5	36.28
12	0 4 55.48	4.800	+0 12 11.7	36.40	12 6 38.4	0 5 27.37	4.802	0 16 13.5	36.38
13	0 6 51.04	4.829	0 26 46.5	36.50	13 6 36.4	0 7 22.96	4.831	0 30 47.7	36.47
14	0 8 47.30	4.858	0 41 23.5	36.59	14 6 34.4	0 9 19.25	4.860	0 45 24.1	36.56
15	0 10 44.25	4.887	0 56 2.6	36.67	15 6 32.4	0 11 16.23	4.888	1 0 2.5	36.64
16	0 12 41.88	4.915	1 10 43.6	36.75	16 6 30.4	0 13 13.88	4.916	1 14 42.8	36.72
17	0 14 40.18	4.942	1 25 26.4	36.82	17 6 28.4	0 15 12.19	4.943	1 29 24.9	36.79
18	0 16 39.13	4.969	1 40 10.8	36.87	18 6 26.5	0 17 11.15	4.969	1 44 8.5	36.84
19	0 18 38.71	4.995	1 54 56.5	36.93	19 6 24.5	0 19 10.74	4.995	1 58 53.3	36.89
20	0 20 38.91	5.021	2 9 43.5	36.98	20 6 22.6	0 21 10.95	5.021	2 13 39.4	36.93
21	0 22 39.72	5.046	2 24 31.6	37.02	21 6 20.6	0 23 11.75	5.046	2 28 26.5	36.98
22	0 24 41.11	5.070	2 39 20.8	37.06	22 6 18.7	0 25 13.13	5.069	2 43 14.7	37.02
23	0 26 43.08	5.094	2 54 11.0	37.10	23 6 16.8	0 27 15.10	5.094	2 58 3.9	37.06
24	0 28 45.64	5.118	3 9 1.8	37.13	24 6 14.9	0 29 17.65	5.118	3 12 53.7	37.09
25	0 30 48.77	5.142	3 23 53.3	37.15	25 6 13.1	0 31 20.77	5.142	3 27 44.2	37.11
26	0 32 52.47	5.166	3 38 45.2	37.17	26 6 11.2	0 33 24.45	5.165	3 42 35.1	37.13
27	0 34 56.73	5.189	3 53 37.7	37.19	27 6 9.3	0 35 28.69	5.188	3 57 26.5	37.14
28	0 37 1.56	5.212	4 8 30.5	37.21	28 6 7.4	0 37 33.50	5.211	4 12 18.2	37.16
29	0 39 6.93	5.235	4 23 23.6	37.22	29 6 5.6	0 39 38.85	5.234	4 27 10.2	37.17
30	0 41 12.85	5.258	4 38 17.0	37.22	30 6 3.8	0 41 44.74	5.256	4 42 2.4	37.17
31	0 43 19.30	5.280	4 53 10.2	37.21	31 6 2.0	0 43 51.16	5.279	4 56 54.6	37.17
32	0 45 26.29	+5.302	+5 8 3.8	+37.20	32 6 0.1	0 45 58.12	+5.302	+5 11 46.6	+37.16

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	17 11 59.16	+2.352	−22 32 22.2	−2.86	0 22 27.3	17 12 51.92	+2.342	−22 33 25.7	−2.79
1	17 12 55.54	2.346	22 33 30.0	2.80	1 22 24.3	17 13 48.04	2.336	22 34 32.0	2.73
2	17 13 51.77	2.340	22 34 36.3	2.73	2 22 21.3	17 14 44.02	2.329	22 35 36.8	2.67
3	17 14 47.86	2.334	22 35 41.2	2.67	3 22 18.3	17 15 39.85	2.323	22 36 40.2	2.61
4	17 15 43.79	2.328	22 36 44.6	2.61	4 22 15.3	17 16 35.51	2.317	22 37 42.1	2.55
5	17 16 39.56	2.321	22 37 46.6	2.55	5 22 12.3	17 17 31.01	2.310	22 38 42.6	2.49
6	17 17 35.17	2.314	22 38 47.1	2.49	6 22 9.3	17 18 26.35	2.302	22 39 41.7	2.43
7	17 18 30.61	2.306	22 39 46.2	2.43	7 22 6.3	17 19 21.51	2.294	22 40 39.3	2.37
8	17 19 25.86	2.298	22 40 43.9	2.37	8 22 3.3	17 20 16.47	2.286	22 41 35.6	2.31
9	17 20 20.93	2.290	22 41 40.1	2.31	9 22 0.3	17 21 11.25	2.278	22 42 30.4	2.25
10	17 21 15.80	2.282	22 42 34.9	2.25	10 21 57.2	17 22 5.82	2.270	22 43 23.8	2.19
11	17 22 10.47	2.274	22 43 28.3	2.19	11 21 54.2	17 23 0.18	2.261	22 44 15.8	2.14
12	17 23 4.93	2.265	22 44 20.2	2.13	12 21 51.2	17 23 54.33	2.252	22 45 6.3	2.08
13	17 23 59.17	2.256	22 45 10.7	2.07	13 21 48.2	17 24 48.25	2.243	22 45 55.4	2.03
14	17 24 53.19	2.246	22 45 59.8	2.01	14 21 45.1	17 25 41.95	2.233	22 46 43.1	1.97
15	17 25 46.98	2.236	22 46 47.5	1.95	15 21 42.1	17 26 35.41	2.223	22 47 29.4	1.91
16	17 26 40.52	2.226	22 47 33.8	1.89	16 21 39.0	17 27 28.61	2.212	22 48 14.4	1.85
17	17 27 33.81	2.215	22 48 18.7	1.83	17 21 36.0	17 28 21.56	2.201	22 48 58.0	1.79
18	17 28 26.85	2.204	22 49 2.3	1.77	18 21 32.9	17 29 14.25	2.190	22 49 40.3	1.73
19	17 29 19.63	2.193	22 49 44.5	1.72	19 21 29.9	17 30 6.67	2.179	22 50 21.2	1.67
20	17 30 12.14	2.182	22 50 25.3	1.67	20 21 26.8	17 30 58.82	2.167	22 51 0.7	1.62
21	17 31 4.37	2.170	22 51 4.8	1.62	21 21 23.7	17 31 50.69	2.155	22 51 39.0	1.57
22	17 31 56.31	2.158	22 51 43.0	1.56	22 21 20.6	17 32 42.26	2.143	22 52 16.0	1.51
23	17 32 47.96	2.146	22 52 19.9	1.50	23 21 17.5	17 33 33.54	2.131	22 52 51.7	1.46
24	17 33 39.32	2.133	22 52 55.5	1.45	24 21 14.5	17 34 24.52	2.118	22 53 26.1	1.41
25	17 34 30.37	2.120	22 53 29.9	1.40	25 21 11.4	17 35 15.19	2.105	22 53 59.3	1.36
26	17 35 21.11	2.107	22 54 3.0	1.35	26 21 8.3	17 36 5.54	2.092	22 54 31.2	1.31
27	17 36 11.53	2.094	22 54 34.9	1.30	27 21 5.2	17 36 55.57	2.079	22 55 2.0	1.26
28	17 37 1.63	2.081	22 55 5.6	1.25	28 21 2.1	17 37 45.27	2.065	22 55 31.6	1.21
29	17 37 51.41	2.067	22 55 35.0	1.20	29 20 59.0	17 38 34.65	2.051	22 55 59.9	1.16
30	17 38 40.86	2.053	22 56 3.3	1.15	30 20 55.8	17 39 23.70	2.037	22 56 27.1	1.11
31	17 39 29.97	2.039	22 56 30.4	1.10	31 20 52.7	17 40 12.40	2.022	22 56 53.1	1.06
Feb. 1	17 40 18.72	2.024	22 56 56.3	1.05	1 20 49.6	17 41 0.74	2.007	22 57 17.9	1.01
2	17 41 7.12	2.009	22 57 21.1	1.00	2 20 46.5	17 41 48.72	1.992	22 57 41.7	0.96
3	17 41 55.16	1.994	22 57 44.8	0.95	3 20 43.3	17 42 36.34	1.976	22 58 4.4	0.91
4	17 42 42.83	1.978	22 58 7.4	0.90	4 20 40.2	17 43 23.58	1.960	22 58 26.0	0.86
5	17 43 30.12	1.962	22 58 28.9	0.86	5 20 37.0	17 44 10.43	1.944	22 58 46.5	0.82
6	17 44 17.02	1.946	22 58 49.4	0.82	6 20 33.9	17 44 56.89	1.928	22 59 6.1	0.78
7	17 45 3.53	1.929	22 59 8.8	0.78	7 20 30.7	17 45 42.96	1.911	22 59 24.6	0.74
8	17 45 49.64	1.912	22 59 27.2	0.74	8 20 25.5	17 46 28.62	1.893	22 59 42.1	0.70
9	17 46 35.33	1.895	22 59 44.6	0.70	9 20 24.3	17 47 13.85	1.876	22 59 58.6	0.66
10	17 47 20.60	1.878	23 0 0.9	0.66	10 20 21.1	17 47 58.66	1.859	23 0 14.0	0.62
11	17 48 5.45	1.860	23 0 16.2	0.62	11 20 17.9	17 48 43.04	1.841	23 0 28.5	0.58
12	17 48 49.86	1.841	23 0 30.6	0.58	12 20 14.7	17 49 26.98	1.822	23 0 42.1	0.54
13	17 49 33.82	1.822	23 0 44.1	0.54	13 20 11.5	17 50 10.46	1.803	23 0 54.8	0.50
14	17 50 17.34	1.803	23 0 56.7	0.50	14 20 8.3	17 50 53.50	1.784	23 1 6.7	0.46
15	17 51 0.40	1.784	23 1 8.4	0.46	15 20 5.1	17 51 36.08	1.764	23 1 17.7	0.43
16	17 51 42.99	1.764	23 1 19.3	0.43	16 20 1.9	17 52 18.18	1.744	23 1 27.9	0.40
17	17 52 25.11	1.744	23 1 29.4	0.40	17 19 58.6	17 52 59.80	1.724	23 1 37.3	0.37
18	17 53 6.75	1.724	23 1 38.6	0.37	18 19 55.4	17 53 40.94	1.704	23 1 45.8	0.34
19	17 53 47.90	1.704	23 1 47.1	0.34	19 19 52.1	17 54 21.59	1.683	23 1 53.7	0.31
20	17 54 28.55	1.683	23 1 54.8	0.31	20 19 48.9	17 55 1.73	1.662	23 2 0.8	0.28
21	17 55 8.70	1.662	23 2 1.8	0.28	21 19 45.6	17 55 41.37	1.641	23 2 7.2	0.25
22	17 55 48.33	1.641	23 2 8.1	0.25	22 19 42.3	17 56 20.49	1.619	23 2 12.9	0.22
23	17 56 27.45	1.619	23 2 13.8	0.22	23 19 39.0	17 56 59.09	1.597	23 2 18.0	0.19
24	17 57 6.05	1.597	23 2 18.8	0.19	24 19 35.7	17 57 37.17	1.575	23 2 22.5	0.16
25	17 57 44.12	1.575	23 2 23.1	0.16	25 19 32.4	17 58 14.72	1.553	23 2 26.3	0.14
26	17 58 21.66	1.553	23 2 26.8	0.13	26 19 29.1	17 58 51.74	1.530	23 2 29.5	0.12
27	17 58 58.66	1.530	23 2 30.0	0.11	27 19 25.8	17 59 28.21	1.507	23 2 32.2	0.10
28	17 59 35.11	1.507	23 2 32.6	0.09	28 19 22.5	18 0 4.13	1.484	23 2 34.3	0.08
29	18 0 11.01	+1.484	−23 2 34.7	−0.07	29 19 19.1	18 0 39.49	+1.461	−23 2 36.0	−0.06

JUPITER, 1877.

Date.	FOR WASHINGTON MEAN NOON.								FOR MERIDIAN TRANSIT.										
1877.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Mean Time of Transit.			Apparent Right Ascension.			Diff. for 1 h. of Long.	Apparent Declination.			Diff. for 1 hour of Long.
	h	m	s	s	°	′	″	″	d	h	m	h	m	s	s	°	′	″	″
Mar. 1	18	0	11.01	+1.484	−23	2	34.7	−0.07	1	19	19.1	18	0	39.49	+1.461	−23	2	36.0	−0.06
2	18	0	46.35	1.461	23	2	36.3	0.05	2	19	15.8	18	1	14.29	1.438	23	2	37.2	0.04
3	18	1	21.12	1.437	23	2	37.3	0.03	3	19	12.4	18	1	48.52	1.414	23	2	37.8	−0.02
4	18	1	55.31	1.412	23	2	37.9	−0.01	4	19	9.0	18	2	22.16	1.389	23	2	38.0	0.00
5	18	2	28.90	1.387	23	2	38.0	0.00	5	19	5.6	18	2	55.20	1.364	23	2	37.8	+0.02
6	18	3	1.90	1.362	23	2	37.7	+0.02	6	19	2.2	18	3	27.65	1.339	23	2	37.2	0.03
7	18	3	34.30	1.337	23	2	37.0	0.04	7	18	58.8	18	3	59.49	1.314	23	2	36.2	0.05
8	18	4	6.09	1.311	23	2	35.9	0.06	8	18	55.4	18	4	30.72	1.288	23	2	34.8	0.06
9	18	4	37.26	1.285	23	2	34.5	0.07	9	18	52.0	18	5	1.33	1.262	23	2	33.2	0.07
10	18	5	7.81	1.259	23	2	32.8	0.08	10	18	48.6	18	5	31.31	1.236	23	2	31.3	0.08
11	18	5	37.72	1.233	23	2	30.8	0.09	11	18	45.1	18	6	0.65	1.209	23	2	29.1	0.09
12	18	6	6.99	1.206	23	2	28.6	0.10	12	18	41.7	18	6	29.34	1.182	23	2	26.7	0.10
13	18	6	35.61	1.179	23	2	26.1	0.11	13	18	38.2	18	6	57.38	1.155	23	2	24.0	0.11
14	18	7	3.58	1.151	23	2	23.4	0.12	14	18	34.7	18	7	24.77	1.127	23	2	21.2	0.12
15	18	7	30.88	1.123	23	2	20.5	0.13	15	18	31.2	18	7	51.49	1.099	23	2	18.2	0.13
16	18	7	57.51	1.095	23	2	17.5	0.13	16	18	27.7	18	8	17.54	1.071	23	2	15.1	0.13
17	18	8	23.46	1.067	23	2	14.3	0.14	17	18	24.2	18	8	42.90	1.043	23	2	11.8	0.14
18	18	8	48.73	1.038	23	2	11.0	0.14	18	18	20.7	18	9	37.58	1.014	23	2	8.5	0.14
19	18	9	13.31	1.009	23	2	7.6	0.14	19	18	17.1	18	9	31.57	0.985	23	2	5.0	0.14
20	18	9	37.19	0.979	23	2	4.2	0.15	20	18	13.6	18	9	54.86	0.955	23	2	1.6	0.15
21	18	10	0.37	0.949	23	2	0.7	0.15	21	18	10.0	18	10	17.45	0.925	23	1	58.1	0.15
22	18	10	22.84	0.919	23	1	57.2	0.15	22	18	6.5	18	10	39.33	0.895	23	1	54.6	0.15
23	18	10	44.60	0.890	23	1	53.7	0.15	23	18	2.9	18	11	0.49	0.866	23	1	51.1	0.15
24	18	11	5.65	0.860	23	1	50.2	0.15	24	17	59.3	18	11	20.95	0.836	23	1	47.6	0.15
25	18	11	25.97	0.830	23	1	46.8	0.14	25	17	55.7	18	11	40.68	0.806	23	1	44.3	0.14
26	18	11	45.56	0.800	23	1	43.4	0.14	26	17	52.0	18	11	59.68	0.776	23	1	40.9	0.14
27	18	12	4.42	0.770	23	1	40.1	0.14	27	17	48.4	18	12	17.94	0.746	23	1	37.7	0.14
28	18	12	22.54	0.739	23	1	36.9	0.13	28	17	44.8	18	12	35.47	0.715	23	1	34.6	0.13
29	18	12	39.92	0.708	23	1	33.8	0.13	29	17	41.1	18	12	52.26	0.684	23	1	31.6	0.13
30	18	12	56.55	0.677	23	1	30.8	0.12	30	17	37.5	18	13	8.29	0.653	23	1	28.7	0.12
31	18	13	12.43	0.646	23	1	28.0	0.11	31	17	33.8	18	13	23.57	0.622	23	1	26.0	0.11
Apr. 1	18	13	27.55	0.614	23	1	25.4	0.10	1	17	30.1	18	13	38.10	0.590	23	1	23.5	0.10
2	18	13	41.90	0.582	23	1	22.9	0.09	2	17	26.4	18	13	51.86	0.558	23	1	21.1	0.09
3	18	13	55.48	0.550	23	1	20.6	0.08	3	17	22.7	18	14	4.84	0.526	23	1	19.0	0.08
4	18	14	8.28	0.518	23	1	18.5	0.07	4	17	19.0	18	14	17.04	0.494	23	1	17.1	0.07
5	18	14	20.31	0.485	23	1	16.7	0.06	5	17	15.3	18	14	28.47	0.461	23	1	15.5	0.06
6	18	14	31.55	0.452	23	1	15.1	0.05	6	17	11.5	18	14	39.11	0.428	23	1	14.1	0.05
7	18	14	42.00	0.419	23	1	13.8	0.04	7	17	7.7	18	14	48.97	0.395	23	1	13.0	0.04
8	18	14	51.66	0.386	23	1	12.8	0.03	8	17	3.9	18	14	58.04	0.362	23	1	12.2	0.03
9	18	15	0.52	0.353	23	1	12.1	0.02	9	17	0.1	18	15	6.31	0.329	23	1	11.7	0.02
10	18	15	8.58	0.319	23	1	11.6	+0.01	10	16	56.3	18	15	13.78	0.295	23	1	11.4	+0.01
11	18	15	15.83	0.285	23	1	11.4	0.00	11	16	52.5	18	15	20.44	0.261	23	1	11.4	−0.01
12	18	15	22.26	0.251	23	1	11.6	−0.01	12	16	48.7	18	15	26.29	0.228	23	1	11.8	0.02
13	18	15	27.88	0.217	23	1	12.1	0.03	13	16	44.9	18	15	31.33	0.194	23	1	12.6	0.04
14	18	15	32.68	0.183	23	1	13.0	0.04	14	16	41.0	18	15	35.55	0.160	23	1	13.7	0.05
15	18	15	36.67	0.149	23	1	14.2	0.05	15	16	37.1	18	15	38.96	0.126	23	1	15.2	0.07
16	18	15	39.84	0.115	23	1	15.8	0.06	16	16	33.2	18	15	41.55	0.092	23	1	17.1	0.08
17	18	15	42.19	0.080	23	1	17.7	0.08	17	16	29.3	18	15	43.33	0.058	23	1	19.3	0.10
18	18	15	43.72	0.046	23	1	20.0	0.10	18	16	25.4	18	15	44.30	+0.024	23	1	21.8	0.11
19	18	15	44.43	+0.012	23	1	22.7	0.12	19	16	21.5	18	15	44.45	−0.010	23	1	24.7	0.13
20	18	15	44.32	−0.022	23	1	25.7	0.14	20	16	17.5	18	15	43.79	0.044	23	1	28.0	0.14
21	18	15	43.39	0.056	23	1	29.1	0.15	21	16	13.6	18	15	42.31	0.078	23	1	31.6	0.16
22	18	15	41.65	0.090	23	1	32.8	0.17	22	16	9.6	18	15	40.03	0.112	23	1	35.5	0.17
23	18	15	39.10	0.124	23	1	36.9	0.18	23	16	5.6	18	15	36.94	0.146	23	1	39.9	0.19
24	18	15	35.74	0.158	23	1	41.4	0.20	24	16	1.6	18	15	33.05	0.179	23	1	44.6	0.20
25	18	15	31.57	0.191	23	1	46.2	0.21	25	15	57.6	18	15	28.36	0.212	23	1	49.6	0.22
26	18	15	26.59	0.224	23	1	51.4	0.22	26	15	53.6	18	15	22.86	0.245	23	1	55.0	0.23
27	18	15	20.81	0.258	23	1	56.9	0.24	27	15	49.6	18	15	16.57	0.278	23	2	0.7	0.24
28	18	15	14.22	0.292	23	2	2.8	0.25	28	15	45.5	18	15	9.47	0.312	23	2	6.8	0.25
29	18	15	6.83	0.325	23	2	9.0	0.26	29	15	41.5	18	15	1.58	0.345	23	2	13.2	0.27
30	18	14	58.64	0.358	23	2	15.6	0.28	30	15	37.4	18	14	52.90	0.378	23	2	20.0	0.28
31	18	14	49.66	−0.391	−23	2	22.5	−0.29	31	15	33.3	18	14	43.43	−0.411	−23	2	27.1	−0.30

JUPITER, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	18 14 49.66	−0.391	−23 2 22.5	−0.29	1 15 33.3	18 14 43.43	−0.411	−23 2 27.1	−0.30
2	18 14 39.88	0.424	23 2 29.7	0.31	2 15 29.2	18 14 33.16	0.444	23 2 34.5	0.31
3	18 14 29.31	0.457	23 2 37.2	0.32	3 15 25.1	18 14 22.12	0.476	23 2 42.2	0.32
4	18 14 17.96	0.490	23 2 45.0	0.33	4 15 20.9	18 14 10.30	0.509	23 2 50.2	0.33
5	18 14 5.82	0.522	23 2 53.1	0.35	5 15 16.8	18 13 57.71	0.541	23 2 58.4	0.34
6	18 13 52.91	0.554	23 3 1.5	0.36	6 15 12.6	18 13 44.35	0.573	23 3 6.9	0.35
7	18 13 39.23	0.586	23 3 10.2	0.37	7 15 8.5	18 13 30.23	0.604	23 3 15.8	0.36
8	18 13 24.79	0.617	23 3 19.1	0.38	8 15 4.3	18 13 15.36	0.635	23 3 24.8	0.37
9	18 13 9.59	0.648	23 3 28.2	0.39	9 15 0.1	18 12 59.74	0.666	23 3 34.0	0.38
10	18 12 53.64	0.679	23 3 37.5	0.39	10 14 55.9	18 12 43.38	0.697	23 3 43.4	0.39
11	18 12 36.96	0.710	23 3 47.0	0.40	11 14 51.7	18 12 26.30	0.727	23 3 53.0	0.40
12	18 12 19.55	0.740	23 3 56.7	0.40	12 14 47.5	18 12 8.50	0.757	23 4 2.8	0.40
13	18 12 1.41	0.770	23 4 6.6	0.40	13 14 43.3	18 11 49.98	0.786	23 4 12.8	0.41
14	18 11 42.57	0.799	23 4 16.8	0.41	14 14 39.0	18 11 30.77	0.814	23 4 23.1	0.41
15	18 11 23.03	0.828	23 4 27.2	0.41	15 14 34.7	18 11 10.87	0.843	23 4 33.5	0.42
16	18 11 2.81	0.857	23 4 37.7	0.42	16 14 30.4	18 10 50.30	0.871	23 4 44.1	0.42
17	18 10 41.91	0.885	23 4 48.2	0.42	17 14 26.1	18 10 29.07	0.899	23 4 54.6	0.43
18	18 10 20.36	0.912	23 4 58.7	0.43	18 14 21.8	18 10 7.20	0.926	23 5 5.1	0.44
19	18 9 58.17	0.938	23 5 9.3	0.43	19 14 17.5	18 9 44.70	0.952	23 5 15.7	0.44
20	18 9 35.35	0.964	23 5 19.9	0.44	20 14 13.2	18 9 21.58	0.977	23 5 26.2	0.44
21	18 9 11.91	0.989	23 5 30.6	0.44	21 14 8.9	18 8 57.86	1.001	23 5 36.9	0.44
22	18 8 47.87	1.013	23 5 41.2	0.44	22 14 4.5	18 8 33.55	1.024	23 5 47.4	0.44
23	18 8 23.25	1.037	23 5 51.8	0.44	23 14 0.2	18 8 8.67	1.047	23 5 58.0	0.44
24	18 7 58.06	1.060	23 6 2.3	0.44	24 13 55.8	18 7 43.23	1.070	23 6 8.4	0.44
25	18 7 32.31	1.083	23 6 12.8	0.43	25 13 51.5	18 7 17.21	1.093	23 6 18.9	0.44
26	18 7 6.03	1.106	23 6 23.2	0.43	26 13 47.1	18 6 50.74	1.115	23 6 29.2	0.43
27	18 6 39.23	1.128	23 6 33.5	0.42	27 13 42.7	18 6 23.73	1.137	23 6 39.4	0.43
28	18 6 11.92	1.149	23 6 43.7	0.42	28 13 38.3	18 5 56.23	1.157	23 6 49.5	0.42
29	18 5 44.12	1.169	23 6 53.9	0.41	29 13 33.9	18 5 28.25	1.176	23 6 59.6	0.42
30	18 5 15.85	1.188	23 7 3.9	0.41	30 13 29.5	18 4 59.81	1.194	23 7 9.4	0.41
31	18 4 47.13	1.206	23 7 13.7	0.40	31 13 25.1	18 4 30.93	1.212	23 7 19.1	0.40
June 1	18 4 17.97	1.223	23 7 23.3	0.39	1 13 20.7	18 4 1.62	1.229	23 7 28.5	0.40
2	18 3 48.39	1.240	23 7 32.7	0.38	2 13 16.3	18 3 31.91	1.245	23 7 37.8	0.39
3	18 3 18.41	1.256	23 7 41.8	0.37	3 13 11.9	18 3 1.81	1.261	23 7 46.7	0.38
4	18 2 48.05	1.272	23 7 50.7	0.36	4 13 7.5	18 2 31.35	1.276	23 7 55.5	0.37
5	18 2 17.32	1.287	23 7 59.4	0.35	5 13 3.1	18 2 0.53	1.290	23 8 4.0	0.35
6	18 1 46.25	1.301	23 8 7.8	0.34	6 12 58.6	18 1 29.38	1.304	23 8 12.2	0.34
7	18 1 14.87	1.314	23 8 16.0	0.33	7 12 54.1	18 0 57.93	1.316	23 8 20.2	0.32
8	18 0 43.19	1.326	23 8 23.9	0.32	8 12 49.6	18 0 26.20	1.327	23 8 27.9	0.31
9	18 0 11.24	1.337	23 8 31.4	0.31	9 12 45.2	17 59 54.22	1.337	23 8 35.3	0.30
10	17 59 39.03	1.347	23 8 38.5	0.29	10 12 40.7	17 59 21.99	1.347	23 8 42.2	0.28
11	17 59 6.60	1.356	23 8 45.3	0.28	11 12 36.2	17 58 49.55	1.355	23 8 48.8	0.27
12	17 58 33.96	1.364	23 8 51.8	0.27	12 12 31.8	17 58 16.92	1.363	23 8 55.1	0.26
13	17 58 1.15	1.371	23 8 58.0	0.26	13 12 27.3	17 57 44.13	1.370	23 9 1.1	0.24
14	17 57 28.20	1.377	23 9 3.9	0.24	14 12 22.8	17 57 11.21	1.375	23 9 6.8	0.23
15	17 56 55.11	1.381	23 9 9.5	0.23	15 12 18.3	17 56 38.17	1.379	23 9 12.2	0.21
16	17 56 21.92	1.384	23 9 14.7	0.21	16 12 13.9	17 56 5.04	1.382	23 9 17.2	0.20
17	17 55 48.65	1.387	23 9 19.5	0.20	17 12 9.4	17 55 31.84	1.384	23 9 21.8	0.18
18	17 55 15.33	1.389	23 9 24.0	0.18	18 12 4.9	17 54 58.60	1.385	23 9 26.1	0.17
19	17 54 41.97	1.390	23 9 28.2	0.17	19 12 0.4	17 54 25.34	1.386	23 9 30.1	0.15
20	17 54 8.59	1.391	23 9 32.0	0.15	20 11 55.9	17 53 52.07	1.386	23 9 33.7	0.14
21	17 53 35.22	1.389	23 9 35.3	0.14	21 11 51.4	17 53 18.82	1.384	23 9 36.8	0.13
22	17 53 1.90	1.386	23 9 38.2	0.12	22 11 46.9	17 52 45.63	1.381	23 9 39.5	0.11
23	17 52 28.66	1.383	23 9 40.7	0.11	23 11 42.4	17 52 12.52	1.377	23 9 41.8	0.10
24	17 51 55.50	1.380	23 9 42.9	0.09	24 11 38.0	17 51 39.51	1.373	23 9 43.8	0.09
25	17 51 22.43	1.376	23 9 44.8	0.08	25 11 33.5	17 51 6.60	1.368	23 9 45.6	0.07
26	17 50 49.46	1.370	23 9 46.4	0.06	26 11 29.0	17 50 33.80	1.362	23 9 47.0	0.06
27	17 50 16.65	1.363	23 9 47.6	0.05	27 11 24.5	17 50 1.17	1.355	23 9 48.1	0.05
28	17 49 44.01	1.355	23 9 48.5	0.03	28 11 20.0	17 49 28.72	1.347	23 9 48.8	0.03
29	17 49 11.57	1.347	23 9 49.1	−0.02	29 11 15.5	17 48 56.48	1.338	23 9 49.3	−0.01
30	17 48 39.35	1.338	23 9 49.3	0.00	30 11 11.0	17 48 24.47	1.329	23 9 49.3	0.00
31	17 48 7.35	−1.328	−23 9 49.2	+0.01	31 11 6.6	17 47 52.68	−1.318	−23 9 49.1	+0.01

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	17 48 7.35	-1.328	-23 9 49.2	+0.01	1 11 6.6	17 47 52.68	-1.318	-23 9 49.1	+0.01
2	17 47 35.59	1.316	23 9 48.8	0.02	2 11 2.1	17 47 21.14	1.306	23 9 48.6	0.02
3	17 47 4.14	1.304	23 9 48.2	0.03	3 10 57.7	17 46 49.92	1.293	23 9 47.9	0.03
4	17 46 32.99	1.291	23 9 47.4	0.04	4 10 53.2	17 46 19.01	1.280	23 9 47.0	0.04
5	17 46 2.16	1.277	23 9 46.4	0.05	5 10 48.8	17 45 48.43	1.266	23 9 45.9	0.05
6	17 45 30.67	1.262	23 9 45.2	0.05	6 10 44.3	17 45 17.20	1.251	23 9 44.6	0.06
7	17 45 1.55	1.246	23 9 43.8	0.06	7 10 39.9	17 44 48.34	1.235	23 9 43.1	0.06
8	17 44 31.81	1.230	23 9 42.2	0.07	8 10 35.5	17 44 18.87	1.218	23 9 41.5	0.07
9	17 44 2.48	1.213	23 9 40.4	0.07	9 10 31.1	17 43 49.81	1.201	23 9 39.6	0.08
10	17 43 33.58	1.195	23 9 38.4	0.08	10 10 26.7	17 43 21.19	1.183	23 9 37.6	0.08
11	17 43 5.13	1.176	23 9 36.4	0.08	11 10 22.3	17 42 53.03	1.164	23 9 35.6	0.08
12	17 42 37.16	1.156	23 9 34.3	0.08	12 10 17.9	17 42 25.35	1.153	23 9 33.4	0.08
13	17 42 9.68	1.135	23 9 32.2	0.09	13 10 13.6	17 41 58.16	1.122	23 9 31.3	0.08
14	17 41 42.70	1.113	23 9 30.0	0.09	14 10 9.2	17 41 31.48	1.100	23 9 29.1	0.09
15	17 41 16.25	1.091	23 9 27.8	0.09	15 10 4.8	17 41 5.34	1.078	23 9 26.9	0.09
16	17 40 50.34	1.068	23 9 25.5	0.09	16 10 0.4	17 40 39.74	1.055	23 9 24.6	0.09
17	17 40 24.99	1.044	23 9 23.2	0.09	17 9 56.1	17 40 14.70	1.031	23 9 22.3	0.09
18	17 40 0.21	1.020	23 9 21.0	0.09	18 9 51.7	17 39 50.23	1.006	23 9 20.1	0.09
19	17 39 36.03	0.995	23 9 18.8	0.09	19 9 47.4	17 39 26.36	0.981	23 9 17.9	0.09
20	17 39 12.45	0.970	23 9 16.7	0.08	20 9 43.1	17 39 3.10	0.956	23 9 15.8	0.09
21	17 38 49.49	0.944	23 9 14.6	0.08	21 9 38.8	17 38 40.46	0.930	23 9 13.8	0.08
22	17 38 27.15	0.917	23 9 12.7	0.08	22 9 34.5	17 38 18.44	0.903	23 9 12.0	0.08
23	17 38 5.45	0.889	23 9 11.0	0.07	23 9 30.2	17 37 57.06	0.876	23 9 10.3	0.08
24	17 37 44.42	0.861	23 9 9.5	0.06	24 9 25.9	17 37 36.35	0.848	23 9 8.9	0.07
25	17 37 24.05	0.833	23 9 8.1	0.05	25 9 21.7	17 37 16.31	0.820	23 9 7.6	0.06
26	17 37 4.35	0.805	23 9 6.9	0.04	26 9 17.5	17 36 56.93	0.792	23 9 6.5	0.05
27	17 36 45.33	0.776	23 9 5.9	0.03	27 9 13.3	17 36 38.23	0.763	23 9 5.6	0.04
28	17 36 27.01	0.747	23 9 5.1	0.02	28 9 9.0	17 36 20.23	0.734	23 9 4.9	0.03
29	17 36 9.40	0.718	23 9 4.6	+0.01	29 9 4.8	17 36 2.94	0.705	23 9 4.5	+0.01
30	17 35 52.50	0.689	23 9 4.4	0.00	30 9 0.6	17 35 46.36	0.676	23 9 4.4	0.00
31	17 35 36.33	0.659	23 9 4.5	-0.01	31 8 56.4	17 35 30.51	0.646	23 9 4.6	-0.01
Aug. 1	17 35 20.89	0.628	23 9 4.9	0.02	1 8 52.2	17 35 15.39	0.615	23 9 5.1	0.03
2	17 35 6.19	0.597	23 9 5.6	0.04	2 8 48.0	17 35 1.00	0.584	23 9 6.0	0.04
3	17 34 52.24	0.566	23 9 6.7	0.05	3 8 43.8	17 34 47.37	0.553	23 9 7.2	0.06
4	17 34 39.05	0.534	23 9 8.2	0.07	4 8 39.6	17 34 34.50	0.521	23 9 8.8	0.07
5	17 34 26.62	0.502	23 9 10.1	0.08	5 8 35.5	17 34 22.38	0.489	23 9 10.8	0.09
6	17 34 14.98	0.469	23 9 12.4	0.10	6 8 31.4	17 34 11.05	0.456	23 9 13.3	0.11
7	17 34 4.12	0.436	23 9 15.1	0.12	7 8 27.3	17 34 0.50	0.423	23 9 16.1	0.13
8	17 33 54.05	0.403	23 9 18.3	0.14	8 8 23.2	17 33 50.73	0.390	23 9 19.4	0.15
9	17 33 44.78	0.370	23 9 21.9	0.16	9 8 19.1	17 33 41.76	0.357	23 9 23.2	0.17
10	17 33 36.31	0.337	23 9 25.9	0.18	10 8 15.1	17 33 33.59	0.324	23 9 27.4	0.19
11	17 33 28.65	0.303	23 9 30.3	0.19	11 8 11.0	17 33 26.22	0.291	23 9 31.9	0.20
12	17 33 21.79	0.269	23 9 35.2	0.21	12 8 7.0	17 33 19.65	0.257	23 9 37.0	0.22
13	17 33 15.74	0.235	23 9 40.6	0.23	13 8 3.0	17 33 13.89	0.223	23 9 42.6	0.24
14	17 33 10.50	0.201	23 9 46.4	0.25	14 7 59.0	17 33 8.94	0.189	23 9 48.5	0.26
15	17 33 6.08	0.167	23 9 52.7	0.27	15 7 55.0	17 33 4.80	0.156	23 9 54.9	0.28
16	17 33 2.47	0.133	23 9 59.5	0.29	16 7 51.0	17 33 1.47	0.122	23 10 1.9	0.30
17	17 32 59.68	0.099	23 10 6.9	0.31	17 7 47.0	17 32 58.95	0.088	23 10 9.4	0.32
18	17 32 57.71	0.065	23 10 14.7	0.33	18 7 43.0	17 32 57.25	0.054	23 10 17.3	0.34
19	17 32 56.56	-0.031	23 10 22.9	0.35	19 7 39.0	17 32 56.56	-0.020	23 10 25.6	0.36
20	17 32 56.23	+0.003	23 10 31.6	0.37	20 7 35.1	17 32 56.29	+0.014	23 10 34.5	0.38
21	17 32 56.72	0.037	23 10 40.8	0.39	21 7 31.2	17 32 57.04	0.048	23 10 43.8	0.40
22	17 32 58.02	0.071	23 10 50.5	0.41	22 7 27.3	17 32 58.59	0.081	23 10 53.6	0.42
23	17 33 0.13	0.105	23 11 0.7	0.43	23 7 23.4	17 33 0.94	0.115	23 11 3.9	0.44
24	17 33 3.05	0.139	23 11 11.4	0.45	24 7 19.5	17 33 4.10	0.149	23 11 14.8	0.46
25	17 33 6.78	0.173	23 11 22.6	0.47	25 7 15.6	17 33 7.07	0.183	23 11 26.1	0.48
26	17 33 11.32	0.207	23 11 34.2	0.49	26 7 11.8	17 33 12.84	0.217	23 11 37.8	0.50
27	17 33 16.67	0.241	23 11 46.3	0.51	27 7 8.0	17 33 18.41	0.250	23 11 50.0	0.52
28	17 33 22.82	0.274	23 11 58.8	0.53	28 7 4.2	17 33 24.78	0.283	23 12 2.6	0.54
29	17 33 29.78	0.307	23 12 11.8	0.55	29 7 0.4	17 33 31.96	0.316	23 12 15.7	0.56
30	17 33 37.54	0.341	23 12 25.3	0.57	30 6 56.6	17 33 39.93	0.349	23 12 29.3	0.58
31	17 33 46.10	+0.374	-23 12 39.2	-0.59	31 6 52.8	17 33 48.70	+0.382	-23 12 43.3	-0.60

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	17 33 55.46	+0.407	−23 12 53.5	−0.60	1 6 49.0	17 33 58.26	+0.415	−23 12 57.7	−0.61
2	17 34 5.61	0.440	23 13 8.3	0.62	2 6 45.2	17 34 8.61	0.448	23 13 12.6	0.63
3	17 34 16.57	0.473	23 13 23.4	0.63	3 6 41.5	17 34 19.76	0.480	23 13 27.7	0.64
4	17 34 28.32	0.506	23 13 38.9	0.65	4 6 37.7	17 34 31.70	0.513	23 13 43.3	0.65
5	17 34 40.86	0.539	23 13 54.9	0.67	5 6 34.0	17 34 44.42	0.545	23 13 59.3	0.67
6	17 34 54.19	0.572	23 14 11.2	0.68	6 6 30.3	17 34 57.93	0.577	23 14 15.6	0.68
7	17 35 8.29	0.604	23 14 27.8	0.70	7 6 26.6	17 35 12.20	0.609	23 14 32.3	0.70
8	17 35 23.17	0.636	23 14 44.8	0.71	8 6 22.9	17 35 27.25	0.641	23 14 49.3	0.71
9	17 35 38.82	0.668	23 15 2.1	0.72	9 6 19.2	17 35 43.06	0.673	23 15 6.6	0.72
10	17 35 55.24	0.700	23 15 19.7	0.73	10 6 15.6	17 35 59.64	0.705	23 15 24.3	0.73
11	17 36 12.42	0.732	23 15 37.5	0.74	11 6 12.0	17 36 16.97	0.737	23 15 42.1	0.74
12	17 36 30.36	0.763	23 15 55.6	0.75	12 6 8.3	17 36 35.06	0.768	23 16 0.2	0.75
13	17 36 49.05	0.794	23 16 13.9	0.76	13 6 4.7	17 36 53.89	0.799	23 16 18.5	0.76
14	17 37 8.49	0.825	23 16 32.5	0.77	14 6 1.1	17 37 13.47	0.830	23 16 37.2	0.77
15	17 37 28.66	0.856	23 16 51.3	0.78	15 5 57.5	17 37 33.77	0.861	23 16 56.0	0.78
16	17 37 49.56	0.886	23 17 10.2	0.79	16 5 53.9	17 37 54.80	0.891	23 17 14.9	0.79
17	17 38 11.19	0.916	23 17 29.3	0.79	17 5 50.3	17 38 16.55	0.921	23 17 34.0	0.79
18	17 38 33.54	0.946	23 17 48.5	0.80	18 5 46.8	17 38 39.62	0.950	23 17 53.1	0.80
19	17 38 56.60	0.975	23 18 7.8	0.80	19 5 43.3	17 39 2.19	0.980	23 18 12.4	0.80
20	17 39 20.37	1.004	23 18 27.2	0.81	20 5 39.7	17 39 26.07	1.009	23 18 31.8	0.80
21	17 39 44.84	1.033	23 18 46.7	0.81	21 5 36.2	17 39 50.64	1.038	23 18 51.2	0.81
22	17 40 10.00	1.062	23 19 6.2	0.81	22 5 32.7	17 40 15.90	1.067	23 19 10.7	0.81
23	17 40 25.84	1.091	23 19 25.7	0.81	23 5 29.2	17 40 41.84	1.095	23 19 30.2	0.81
24	17 41 2.35	1.119	23 19 45.2	0.81	24 5 25.7	17 41 8.44	1.123	23 19 49.6	0.81
25	17 41 29.55	1.147	23 20 4.7	0.81	25 5 22.2	17 41 35.72	1.151	23 20 9.1	0.81
26	17 41 57.42	1.175	23 20 24.2	0.81	26 5 18.7	17 42 3.67	1.178	23 20 28.5	0.80
27	17 42 25.95	1.202	23 20 43.7	0.80	27 5 15.3	17 42 32.28	1.205	23 20 47.9	0.80
28	17 42 55.13	1.229	23 21 3.0	0.80	28 5 11.8	17 43 1.53	1.232	23 21 7.2	0.80
29	17 43 24.96	1.256	23 21 22.2	0.80	29 5 8.4	17 43 31.43	1.258	23 21 26.3	0.79
30	17 43 55.44	1.283	23 21 41.2	0.79	30 5 5.0	17 44 1.97	1.285	23 21 45.2	0.79
Oct. 1	17 44 26.56	1.310	23 22 0.1	0.78	1 5 1.6	17 44 33.15	1.312	23 22 4.0	0.78
2	17 44 58.31	1.336	23 22 18.8	0.77	2 4 58.2	17 45 4.96	1.338	23 22 22.6	0.77
3	17 45 30.69	1.362	23 22 37.3	0.76	3 4 54.8	17 45 37.39	1.364	23 22 41.0	0.76
4	17 46 3.69	1.388	23 22 55.5	0.75	4 4 51.4	17 46 10.44	1.390	23 22 59.1	0.75
5	17 46 37.31	1.413	23 23 13.4	0.74	5 4 48.1	17 46 44.10	1.415	23 23 16.9	0.74
6	17 47 11.53	1.438	23 23 31.0	0.73	6 4 44.7	17 47 18.36	1.440	23 23 34.4	0.73
7	17 47 46.35	1.463	23 23 48.3	0.72	7 4 41.3	17 47 53.22	1.465	23 23 51.6	0.71
8	17 48 21.77	1.488	23 24 5.2	0.70	8 4 38.0	17 48 28.67	1.489	23 24 8.4	0.69
9	17 48 57.78	1.512	23 24 21.7	0.68	9 4 34.7	17 49 4.71	1.513	23 24 24.8	0.67
10	17 49 34.36	1.536	23 24 37.8	0.66	10 4 31.3	17 49 41.31	1.537	23 24 40.8	0.65
11	17 50 11.51	1.560	23 24 53.5	0.64	11 4 28.0	17 50 18.48	1.560	23 24 56.4	0.63
12	17 50 49.24	1.583	23 25 8.8	0.62	12 4 24.7	17 50 56.23	1.583	23 25 11.6	0.61
13	17 51 27.51	1.606	23 25 23.5	0.60	13 4 21.4	17 51 34.51	1.606	23 25 26.1	0.59
14	17 52 6.33	1.628	23 25 37.7	0.58	14 4 18.1	17 52 13.33	1.628	23 25 40.2	0.57
15	17 52 45.69	1.650	23 25 51.3	0.56	15 4 14.8	17 52 52.70	1.650	23 25 53.7	0.55
16	17 53 25.58	1.672	23 26 4.3	0.54	16 4 11.5	17 53 32.59	1.672	23 26 6.6	0.53
17	17 54 5.99	1.694	23 26 16.8	0.51	17 4 8.3	17 54 13.00	1.694	23 26 18.9	0.51
18	17 54 46.92	1.716	23 26 28.7	0.48	18 4 5.0	17 54 53.92	1.716	23 26 30.7	0.48
19	17 55 28.36	1.737	23 26 39.9	0.45	19 4 1.8	17 55 35.36	1.737	23 26 41.8	0.45
20	17 56 10.30	1.758	23 26 50.5	0.42	20 3 58.6	17 56 17.29	1.758	23 26 52.3	0.42
21	17 56 52.73	1.778	23 27 0.4	0.39	21 3 55.4	17 56 59.71	1.778	23 27 2.0	0.39
22	17 57 35.65	1.798	23 27 9.6	0.36	22 3 52.1	17 57 42.61	1.798	23 27 11.1	0.36
23	17 58 19.05	1.818	23 27 18.0	0.33	23 3 48.9	17 58 25.99	1.818	23 27 19.3	0.33
24	17 59 2.93	1.838	23 27 25.6	0.30	24 3 45.7	17 59 9.85	1.837	23 27 26.8	0.30
25	17 59 47.27	1.857	23 27 32.4	0.27	25 3 42.5	17 59 54.16	1.856	23 27 33.4	0.27
26	18 0 32.08	1.876	23 27 38.4	0.24	26 3 39.3	18 0 38.94	1.875	23 27 39.3	9.24
27	18 1 17.34	1.895	23 27 43.6	0.20	27 3 36.1	18 1 24.17	1.894	23 27 44.3	0.20
28	18 2 3.04	1.914	23 27 48.0	0.16	28 3 32.9	18 2 9.84	1.912	23 27 48.6	0.16
29	18 2 49.19	1.932	23 27 51.5	0.12	29 3 29.8	18 2 55.95	1.930	23 27 51.9	0.12
30	18 3 35.78	1.950	23 27 54.1	0.08	30 3 26.6	18 3 42.50	1.948	23 27 54.4	0.08
31	18 4 22.80	+1.968	−23 27 55.7	−0.04	31 3 23.5	18 4 29.48	+1.966	−23 27 55.9	−0.04

JUPITER, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	18 5 10.23	+1.986	-23 27 56.3	0.00	1 3 20.4	18 5 16.87	+1.984	-23 27 56.4	0.00
2	18 5 58.69	2.003	23 27 56.0	+0.04	2 3 17.3	18 6 4.68	2.001	23 27 55.9	+0.04
3	18 6 46.36	2.020	23 27 54.7	0.08	3 3 14.1	18 6 52.90	2.018	23 27 54.5	0.08
4	18 7 35.03	2.036	23 27 52.4	0.12	4 3 11.0	18 7 41.52	2.034	23 27 52.0	0.13
5	18 8 24.10	2.052	23 27 49.0	0.16	5 3 7.9	18 8 30.53	2.050	23 27 48.5	0.17
6	18 9 13.76	2.068	23 27 44.5	0.21	6 3 4.8	18 9 19.93	2.066	23 27 43.9	0.21
7	18 10 3.40	2.084	23 27 38.9	0.26	7 3 1.7	18 10 9.71	2.082	23 27 38.1	0.26
8	18 10 53.61	2.099	23 27 32.2	0.30	8 2 58.6	18 10 59.86	2.097	23 27 31.3	0.31
9	18 11 44.17	2.114	23 27 24.4	0.35	9 2 55.5	18 11 50.36	2.112	23 27 23.4	0.36
10	18 12 35.10	2.129	23 27 15.4	0.40	10 2 52.4	18 12 41.22	2.127	23 27 14.3	0.41
11	18 13 26.38	2.143	23 27 5.3	0.45	11 2 49.3	18 13 32.43	2.141	23 27 4.0	0.46
12	18 14 18.00	2.157	23 26 54.0	0.50	12 2 46.2	18 14 23.98	2.155	23 26 52.6	0.51
13	18 15 9.94	2.171	23 26 41.5	0.55	13 2 43.1	18 15 15.85	2.169	23 26 40.0	0.56
14	18 16 2.22	2.184	23 26 27.8	0.60	14 2 40.1	18 16 8.05	2.182	23 26 26.2	0.61
15	18 16 54.82	2.197	23 26 12.9	0.65	15 2 37.0	18 17 0.57	2.195	23 26 11.2	0.66
16	18 17 47.73	2.210	23 25 56.7	0.70	16 2 34.0	18 17 53.40	2.208	23 25 54.9	0.71
17	18 18 40.93	2.223	23 25 39.2	0.75	17 2 30.9	18 18 46.52	2.220	23 25 37.3	0.76
18	18 19 34.44	2.235	23 25 20.5	0.80	18 2 27.9	18 19 39.95	2.232	23 25 18.5	0.81
19	18 20 28.24	2.247	23 25 0.5	0.85	19 2 24.8	18 20 33.66	2.244	23 24 58.4	0.86
20	18 21 22.33	2.259	23 24 39.1	0.90	20 2 21.8	18 21 27.66	2.256	23 24 36.9	0.91
21	18 22 16.70	2.271	23 24 16.4	0.95	21 2 18.8	18 22 21.94	2.268	23 24 14.1	0.96
22	18 23 11.34	2.282	23 23 52.4	1.01	22 2 15.8	18 23 16.49	2.279	23 23 50.1	1.02
23	18 24 6.25	2.293	23 23 27.1	1.07	23 2 12.8	18 24 11.31	2.290	23 23 24.7	1.08
24	18 25 1.42	2.304	23 23 0.4	1.13	24 2 9.7	18 25 6.39	2.301	23 22 57.9	1.14
25	18 25 56.84	2.315	23 22 32.3	1.19	25 2 6.7	18 26 1.72	2.311	23 22 29.8	1.20
26	18 26 52.51	2.325	23 22 2.9	1.25	26 2 3.7	18 26 57.30	2.321	23 22 0.3	1.26
27	18 27 48.43	2.335	23 21 32.1	1.31	27 2 0.7	18 27 53.13	2.331	23 21 29.5	1.32
28	18 28 44.58	2.345	23 20 59.8	1.37	28 1 57.7	18 28 49.18	2.341	23 20 57.1	1.38
29	18 29 40.96	2.354	23 20 26.1	1.43	29 1 54.7	18 29 45.46	2.350	23 20 23.4	1.44
30	18 30 37.57	2.363	23 19 50.9	1.49	30 1 51.7	18 30 41.97	2.359	23 19 48.1	1.50
Dec. 1	18 31 34.40	2.372	23 19 14.3	1.55	1 1 48.7	18 31 38.70	2.368	23 19 11.5	1.56
2	18 32 31.44	2.381	23 18 36.1	1.61	2 1 45.7	18 32 35.64	2.376	23 18 33.3	1.62
3	18 33 28.67	2.389	23 17 56.5	1.67	3 1 42.8	18 33 32.77	2.384	23 17 53.7	1.68
4	18 34 26.11	2.397	23 17 15.5	1.73	4 1 39.8	18 34 30.10	2.392	23 17 12.6	1.74
5	18 35 23.74	2.405	23 16 33.0	1.79	5 1 36.8	18 35 27.62	2.400	23 16 30.1	1.80
6	18 36 21.56	2.413	23 15 49.0	1.85	6 1 33.8	18 36 25.32	2.408	23 15 46.1	1.86
7	18 37 19.55	2.420	23 15 3.5	1.92	7 1 30.9	18 37 23.21	2.415	23 15 0.6	1.92
8	18 38 17.70	2.427	23 14 16.6	1.98	8 1 27.9	18 38 21.25	2.422	23 14 13.7	1.98
9	18 39 16.01	2.433	23 13 28.2	2.04	9 1 24.9	18 39 19.45	2.428	23 13 25.3	2.05
10	18 40 14.48	2.439	23 12 38.3	2.10	10 1 22.0	18 40 17.81	2.434	23 12 35.4	2.11
11	18 41 13.09	2.445	23 11 46.8	2.17	11 1 19.0	18 41 16.31	2.440	23 11 44.0	2.17
12	18 42 11.84	2.451	23 10 53.8	2.23	12 1 16.1	18 42 14.95	2.446	23 10 51.0	2.24
13	18 43 10.73	2.456	23 9 59.3	2.30	13 1 13.2	18 43 13.73	2.451	23 9 56.5	2.30
14	18 44 9.74	2.461	23 9 3.3	2.36	14 1 10.2	18 44 12.63	2.456	23 9 0.6	2.37
15	18 45 8.88	2.466	23 8 5.9	2.42	15 1 7.3	18 45 11.65	2.461	23 8 3.2	2.43
16	18 46 8.12	2.471	23 7 6.9	2.49	16 1 4.3	18 46 10.77	2.466	23 7 4.2	2.49
17	18 47 7.47	2.475	23 6 6.4	2.55	17 1 1.4	18 47 10.01	2.470	23 6 3.8	2.55
18	18 48 6.92	2.479	23 5 4.4	2.61	18 0 58.4	18 48 9.34	2.474	23 5 1.8	2.61
19	18 49 6.45	2.483	23 4 0.9	2.67	19 0 55.5	18 49 8.75	2.478	23 3 58.4	2.68
20	18 50 6.09	2.487	23 2 55.9	2.74	20 0 52.5	18 50 8.27	2.482	23 2 53.5	2.74
21	18 51 5.81	2.490	23 1 49.4	2.80	21 0 49.6	18 51 7.87	2.485	23 1 47.1	2.80
22	18 52 5.61	2.493	23 0 41.4	2.86	22 0 46.6	18 52 7.55	2.488	23 0 39.2	2.87
23	18 53 5.48	2.496	22 59 31.9	2.93	23 0 43.7	18 53 7.30	2.491	22 59 29.8	2.93
24	18 54 5.42	2.499	22 58 21.0	2.99	24 0 40.7	18 54 7.12	2.494	22 58 19.0	2.99
25	18 55 5.42	2.501	22 57 8.5	3.05	25 0 37.8	18 55 7.00	2.496	22 57 6.6	3.05
26	18 56 5.47	2.503	22 55 54.5	3.11	26 0 34.8	18 56 6.93	2.498	22 55 52.7	3.11
27	18 57 5.58	2.505	22 54 39.0	3.17	27 0 31.9	18 57 6.91	2.500	22 54 37.3	3.17
28	18 58 5.73	2.507	22 53 22.1	3.24	28 0 29.0	18 58 6.94	2.502	22 53 20.5	3.24
29	18 59 5.92	2.508	22 52 3.7	3.30	29 0 26.0	18 59 7.01	2.503	22 52 2.2	3.30
30	19 0 6.13	2.509	22 50 43.8	3.36	30 0 23.1	19 0 7.09	2.504	22 50 42.4	3.36
31	19 1 6.37	+2.510	-22 49 22.3	+3.42	31 0 20.1	19 1 7.21	+2.505	-22 49 21.1	+3.42

SATURN, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	22 26 24.36	+0.832	-11 36 4.8	+5.02	0 3 44.0	22 26 27.47	+0.831	-11 35 46.1	+5.01
1	22 26 44.46	0.843	11 34 3.7	5.08	1 3 40.4	22 26 47.55	0.842	11 33 45.0	5.07
2	22 27 4.82	0.854	11 32 1.1	5.14	2 3 36.8	22 27 7.89	0.853	11 31 42.5	5.13
3	22 27 25.43	0.864	11 29 57.1	5.20	3 3 33.2	22 27 28.49	0.863	11 29 38.6	5.19
4	22 27 46.28	0.874	11 27 51.6	5.26	4 3 29.6	22 27 49.33	0.873	11 27 33.2	5.25
5	22 28 7.37	0.884	11 25 44.7	5.32	5 3 26.0	22 28 10.41	0.883	11 25 26.4	5.31
6	22 28 28.70	0.894	11 23 36.4	5.37	6 3 22.4	22 28 31.72	0.893	11 23 18.3	5.36
7	22 28 50 27	0.904	11 21 26.8	5.43	7 3 18.9	22 28 53.26	0.902	11 21 8.9	5.42
8	22 29 12.07	0.913	11 19 15.9	5.48	8 3 15.3	22 29 15.03	0.912	11 18 58.2	5.47
9	22 29 34.09	0.922	11 17 3.8	5.53	9 3 11.7	22 29 37.03	0.921	11 16 46.2	5.53
10	22 29 56.34	0.932	11 14 50.4	5.59	10 3 8.2	22 29 59.26	0.930	11 14 32.9	5.58
11	22 30 18.81	0.941	11 12 35.7	5.64	11 3 4.6	22 30 21.70	0.939	11 12 18.4	5.63
12	22 30 41.49	0.949	11 10 19.8	5.69	12 3 1.1	22 30 44.35	0.948	11 10 2.6	5.68
13	22 31 4.38	0.958	11 8 2.6	5.74	13 2 57.5	22 31 7.21	0.957	11 7 45.6	5.73
14	22 31 27.47	0 966	11 5 44.2	5.79	14 2 54.0	22 31 30.27	0.965	11 5 27.4	5.78
15	22 31 50.75	0.974	11 3 24.6	5.84	15 2 50.4	22 31 53.52	0.973	11 3 8.0	5.83
16	22 32 14.23	0.982	11 1 3.9	5.89	16 2 46.9	22 32 16.96	0.981	11 0 47.5	5.88
17	22 32 37.90	0.990	10 58 42.1	5.93	17 2 43.3	22 32 40.59	0.989	10 58 25.9	5.92
18	22 33 1.76	0.998	10 56 19.3	5.97	18 2 39.8	22 33 4.41	0.996	10 56 3.3	5.96
19	22 33 25.80	1.005	10 53 55.4	6.02	19 2 36.3	22 33 28.41	1.004	10 53 39.7	6.00
20	22 33 50.01	1.012	10 51 30.5	6.06	20 2 32.7	22 33 52.59	1.011	10 51 15.1	6.05
21	22 34 14.38	1.019	10 49 4.6	6.10	21 2 29.2	22 34 16.93	1.017	10 48 49.5	6.09
22	22 34 38.92	1.026	10 46 37.8	6.14	22 2 25.7	22 34 41.43	1.024	10 46 22.9	6.13
23	22 35 3.63	1.033	10 44 10.0	6.18	23 2 22.2	22 35 6.09	1.031	10 43 55.3	6.17
24	22 35 28.50	1.039	10 41 41.2	6.22	24 2 18.6	22 35 30.91	1.037	10 41 26.8	6.21
25	22 35 53.52	1.045	10 39 11.5	6.25	25 2 15.1	22 35 55.88	1.043	10 38 57.4	6.24
26	22 36 18.68	1.051	10 36 41.0	6.29	26 2 11.6	22 36 20.99	1.049	10 36 27.2	6.27
27	22 36 43.98	1.057	10 34 9.7	6.32	27 2 8.1	22 36 46.24	1.055	10 33 56.2	6.31
28	22 37 9.42	1.063	10 31 37.6	6.35	28 2 4.6	22 37 11.63	1.061	10 31 24.4	6.34
29	22 37 34.99	1.068	10 29 4.7	6.39	29 2 1.1	22 37 37.15	1.066	10 28 51.8	6.38
30	22 38 0.69	1.074	10 26 31.0	6.42	30 1 57.6	22 38 2.79	1.071	10 26 18.4	6.41
31	22 38 26.52	1.079	10 23 56.6	6.45	31 1 54.1	22 38 28.56	1.076	10 23 44.3	6.44
Feb. 1	22 38 52.47	1.084	10 21 21.5	6.48	1 1 50.6	22 38 54.46	1.082	10 21 9.5	6.47
2	22 39 18.54	1.089	10 18 45.6	6.51	2 1 47.1	22 39 20.48	1.086	10 18 33.9	6.50
3	22 39 44.72	1.093	10 16 9.0	6.54	3 1 43.6	22 39 46.61	1.091	10 15 57.6	6.52
4	22 40 11.01	1.098	10 13 31.7	6.57	4 1 40.1	22 40 12.84	1.095	10 13 20.7	6.55
5	22 40 37.40	1.102	10 10 53.8	6.59	5 1 36.6	22 40 39.18	1.099	10 10 43.2	6.57
6	22 41 3.89	1.106	10 8 15.4	6.61	6 1 33.1	22 41 5.61	1.103	10 8 5.1	6.60
7	22 41 30.48	1.110	10 5 36.4	6.64	7 1 29.6	22 41 32.14	1.107	10 5 26.5	6.62
8	22 41 57.17	1.114	10 2 56.8	6.66	8 1 26.1	22 41 58.77	1.111	10 2 47.3	6.65
9	22 42 23.95	1.117	10 0 16.7	6.68	9 1 22.6	22 42 25.49	1.115	10 0 7.5	6.67
10	22 42 50.81	1.121	9 57 36.1	6.70	10 1 19.1	22 42 52.29	1.118	9 57 27.2	6.69
11	22 43 17.74	1.124	9 54 55.0	6.72	11 1 15.6	22 43 19.16	1.121	9 54 46.5	6.71
12	22 43 44.75	1.127	9 52 13.5	6.74	12 1 12.2	22 43 46.11	1.124	9 52 5.3	6.72
13	22 44 11.83	1.130	9 49 31.5	6.76	13 1 8.7	22 44 13.13	1.127	9 49 23.7	6.74
14	22 44 38.98	1.132	9 46 49.1	6.78	14 1 5.2	22 44 40.21	1.130	9 46 41.7	6.76
15	22 45 6.18	1.134	9 44 6.4	6.79	15 1 1.7	22 45 7.35	1.132	9 43 59.4	6.77
16	22 45 33.43	1.136	9 41 23.4	6.80	16 0 58.2	22 45 34.54	1.134	9 41 16.8	6.78
17	22 46 0.73	1.138	9 38 40.1	6.81	17 0 54.8	22 46 1.78	1.136	9 38 33.9	6.79
18	22 46 28.08	1.140	9 35 56.5	6.82	18 0 51 3	22 46 29.06	1.138	9 35 50.7	6.80
19	22 46 55.47	1.142	9 33 12.7	6.83	19 0 47.8	22 46 56.38	1.139	9 33 7.3	6.81
20	22 47 22.89	1.143	9 30 28.7	6.84	20 0 44.3	22 47 23.74	1.141	9 30 23.7	6.82
21	22 47 50.34	1.144	9 27 44.5	6.84	21 0 40.9	22 47 51.13	1.142	9 27 39.9	6.83
22	22 48 17.82	1.146	9 25 0.2	6.85	22 0 37.4	22 48 18.54	1.143	9 24 55.9	6.84
23	22 48 45.33	1.147	9 22 15.7	6.86	23 0 33.9	22 48 45.98	1.144	9 22 11.8	6.84
24	22 49 12.87	1.148	9 19 31.1	6.86	24 0 30.4	22 49 13.45	1.145	9 19 27.6	6.84
25	22 49 40.42	1.148	9 16 46.4	6.86	25 0 27.0	22 49 40.94	1.145	9 16 43.3	6.85
26	22 50 7.98	1.148	9 14 1.7	6.86	26 0 23.5	22 50 8.43	1.145	9 13 59.0	6.85
27	22 50 35.54	1.148	9 11 16.9	6.87	27 0 20.0	22 50 35.92	1.145	9 11 14.6	6.85
28	22 51 3.10	1.148	9 8 32.1	6.87	28 0 16.5	22 51 3.41	1.145	9 8 30.2	6.85
29	22 51 30.65	+1.148	- 9 5 47.3	+6.86	29 0 13.1	22 51 30.90	+1.145	- 9 5 45.8	+6.85

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	22 51 30.65	+1.148	−9 5 47.3	+6.86	1 0 13.1	22 51 30.90	+1.145	−9 5 45.8	+6.85
2	22 51 58.20	1.148	9 3 2.6	6.86	2 0 9.6	22 51 58.39	1.145	9 3 1.5	6.85
3	22 52 25.76	1.148	9 0 17.9	6.86	3 0 6.1	22 52 25.87	1.145	9 0 17.2	6.84
4	22 52 53.29	1.147	8 57 33.3	6.86	4 0 2.6	22 52 53.34	1.144	8 57 33.0	6.84
					4 23 59.1	22 53 20.80	1.144	8 54 48.9	6.84
5	22 53 20.82	1.147	8 54 48.8	6.85	5 23 55.7	22 53 48.25	1.143	8 52 4.9	6.83
6	22 53 48.34	1.146	8 52 4.4	6.85	6 23 52.2	22 54 15.68	1.142	8 49 21.1	6.82
7	22 54 15.83	1.145	8 49 20.2	6.84	7 23 48.7	22 54 43.07	1.140	8 46 37.5	6.81
8	22 54 43.28	1.143	8 46 36.2	6.83	8 23 45.2	22 55 10.42	1.139	8 43 54.1	6.80
9	22 55 10.70	1.142	8 43 52.4	6.82	9 23 41.8	22 55 37.73	1.137	8 41 10.9	6.80
10	22 55 38.08	1.140	8 41 8.8	6.81	10 23 38.3	22 56 5.00	1.135	8 38 27.9	6.79
11	22 56 5.41	1.138	8 38 25.4	6.80	11 23 34.8	22 56 32.22	1.133	8 35 45.2	6.77
12	22 56 32.70	1.136	8 35 42.3	6.79	12 23 31.3	22 56 59.40	1.131	8 33 2.9	6.75
13	22 56 59.94	1.134	8 32 59.6	6.77	13 23 27.8	22 57 26.53	1.129	8 30 21.0	6.74
14	22 57 27.13	1.132	8 30 17.3	6.75	14 23 24.4	22 57 53.61	1.127	8 27 39.6	6.72
15	22 57 54.27	1.130	8 27 35.5	6.73	15 23 20.9	22 58 20.62	1.124	8 24 58.6	6.70
16	22 58 21.35	1.127	8 24 54.1	6.71	16 23 17.4	22 58 47.56	1.121	8 22 18.0	6.68
17	22 58 48.36	1.124	8 22 13.2	6.70	17 23 13.9	22 59 14.42	1.118	8 19 37.8	6.66
18	22 59 15.29	1.120	8 19 32.7	6.68	18 23 10.4	22 59 41.21	1.115	8 16 58.1	6.64
19	22 59 42.14	1.117	8 16 52.7	6.66	19 23 7.0	23 0 7.92	1.111	8 14 18.9	6.62
20	23 0 8.91	1.114	8 14 13.1	6.64	20 23 3.5	23 0 34.55	1.108	8 11 40.2	6.60
21	23 0 35.60	1.110	8 11 34.0	6.62	21 23 0.0	23 1 1.09	1.104	8 9 2.1	6.58
22	23 1 2.20	1.106	8 8 55.5	6.59	22 22 56.5	23 1 27.54	1.100	8 6 24.6	6.55
23	23 1 28.70	1.102	8 6 17.7	6.56	23 22 53.0	23 1 53.89	1.096	8 3 47.8	6.52
24	23 1 55.11	1.099	8 3 40.6	6.53	24 22 49.5	23 2 20.15	1.092	8 1 11.7	6.49
25	23 2 21.43	1.095	8 1 4.2	6.50	25 22 46.0	23 2 46.31	1.088	7 58 36.3	6.46
26	23 2 47.65	1.090	7 58 28.4	6.48	26 22 42.5	23 3 12.36	1.083	7 56 1.6	6.43
27	23 3 13.76	1.086	7 55 53.3	6.45	27 22 39.0	23 3 38.30	1.078	7 53 27.6	6.40
28	23 3 39.76	1.081	7 53 18.9	6.42	28 22 35.5	23 4 4.12	1.073	7 50 54.4	6.37
29	23 4 5.64	1.076	7 50 45.3	6.38	29 22 32.0	23 4 29.82	1.069	7 48 21.9	6.34
30	23 4 31.40	1.071	7 48 12.5	6.35	30 22 28.5	23 4 55.41	1.064	7 45 50.1	6.31
31	23 4 57.04	1.066	7 45 40.4	6.32	31 22 25.0	23 5 20.88	1.059	7 43 19.1	6.27
Apr. 1	23 5 22.56	1.061	7 43 9.1	6.29	1 22 21.4	23 5 46.22	1.053	7 40 49.0	6.24
2	23 5 47.95	1.056	7 40 38.7	6.25	2 22 17.9	23 6 11.43	1.048	7 38 19.8	6.20
3	23 6 13.21	1.050	7 38 9.2	6.21	3 22 14.4	23 6 36.50	1.042	7 35 51.5	6.16
4	23 6 38.33	1.044	7 35 40.7	6.17	4 22 10.9	23 7 1.43	1.036	7 33 24.2	6.12
5	23 7 3.32	1.038	7 33 13.1	6.13	5 22 7.4	23 7 26.22	1.030	7 30 57.8	6.08
6	23 7 28.16	1.032	7 30 46.4	6.09	6 22 3.9	23 7 50.86	1.024	7 28 32.4	6.04
7	23 7 52.85	1.026	7 28 20.7	6.05	7 22 0.3	23 8 15.36	1.018	7 26 8.0	6.00
8	23 8 17.39	1.019	7 25 56.0	6.01	8 21 56.8	23 8 39.71	1.011	7 23 44.6	5.95
9	23 8 41.78	1.013	7 23 32.3	5.97	9 21 53.3	23 9 3.90	1.004	7 21 22.3	5.91
10	23 9 6.02	1.006	7 21 9.7	5.92	10 21 49.8	23 9 27.92	0.998	7 19 1.0	5.86
11	23 9 30.09	0.999	7 18 48.2	5.87	11 21 46.2	23 9 51.78	0.991	7 16 40.8	5.82
12	23 9 53.99	0.992	7 16 27.8	5.83	12 21 42.7	23 10 15.47	0.983	7 14 21.7	5.77
13	23 10 17.72	0.985	7 14 8.5	5.78	13 21 39.1	23 10 38.98	0.976	7 12 3.8	5.72
14	23 10 41.27	0.977	7 11 50.4	5.73	14 21 35.6	23 11 2.30	0.968	7 9 47.2	5.67
15	23 11 4.63	0.970	7 9 33.5	5.68	15 21 32.1	23 11 25.44	0.960	7 7 31.8	5.62
16	23 11 27.81	0.962	7 7 17.9	5.62	16 21 28.5	23 11 48.39	0.952	7 5 17.6	5.56
17	23 11 50.80	0.954	7 5 3.5	5.57	17 21 25.0	23 12 11.16	0.945	7 3 4.7	5.51
18	23 12 13.61	0.946	7 2 50.4	5.52	18 21 21.4	23 12 33.74	0.937	7 0 53.1	5.46
19	23 12 36.23	0.938	7 0 38.6	5.46	19 21 17.8	23 12 56.13	0.929	6 58 42.8	5.40
20	23 12 58.65	0.930	6 58 28.1	5.41	20 21 14.3	23 13 18.32	0.920	6 56 33.8	5.35
21	23 13 20.87	0.921	6 56 19.0	5.35	21 21 10.7	23 13 40.30	0.911	6 54 26.2	5.29
22	23 13 42.88	0.913	6 54 11.3	5.29	22 21 7.1	23 14 2.07	0.902	6 52 20.0	5.23
23	23 14 4.68	0.904	6 52 4.9	5.24	23 21 3.6	23 14 23.62	0.894	6 50 15.2	5.17
24	23 14 26.26	0.895	6 49 59.9	5.18	24 21 0.0	23 14 44.96	0.885	6 48 11.8	5.11
25	23 14 47.62	0.886	6 47 56.4	5.12	25 20 56.4	23 15 6.08	0.876	6 46 9.8	5.05
26	23 15 8.77	0.877	6 45 54.3	5.06	26 20 52.8	23 15 26.99	0.867	6 44 9.3	4.99
27	23 15 29.70	0.868	6 43 53.7	4.99	27 20 49.2	23 15 47.68	0.857	6 42 10.3	4.93
28	23 15 50.41	0.858	6 41 54.6	4.93	28 20 45.6	23 16 8.14	0.848	6 40 12.8	4.86
29	23 16 10.89	0.849	6 39 57.0	4.87	29 20 42.0	23 16 28.37	0.838	6 38 16.8	4.80
30	23 16 31.14	+0.839	−6 38 1.0	+4.80	30 20 38.4	23 16 48.37	+0.829	−6 36 22.4	+4.73

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	23 16 51.16	+0.829	−6 36 6.5	+4.74	1 20 34.8	23 17 8.14	+0.819	−6 34 29.6	+4.67
2	23 17 10.95	0.819	6 34 13.6	4.67	2 20 31.2	23 17 27.67	0.809	6 32 38.4	4.60
3	23 17 30.49	0.809	6 32 22.3	4.60	3 20 27.6	23 17 46.95	0.798	6 30 48.8	4.53
4	23 17 49.78	0.799	6 30 32.7	4.53	4 20 24.0	23 18 5.98	0.788	6 29 0.9	4.46
5	23 18 8.82	0.788	6 28 44.8	4.46	5 20 20.4	23 18 24.76	0.777	6 27 14.6	4.39
6	23 18 27.61	0.778	6 26 58.5	4.39	6 20 16.8	23 18 43.29	0.767	6 25 30.0	4.32
7	23 18 46.15	0.767	6 25 13.9	4.32	7 20 13.1	23 19 1.56	0.756	6 23 47.1	4.25
8	23 19 4.43	0.756	6 23 31.1	4.25	8 20 9.5	23 19 19.57	0.745	6 22 6.0	4.17
9	23 19 22.44	0.745	6 21 50.0	4.17	9 20 5.9	23 19 37.32	0.734	6 20 26.7	4.10
10	23 19 40.19	0.734	6 20 10.7	4.10	10 20 2.2	23 19 54.80	0.722	6 18 49.2	4.02
11	23 19 57.67	0.723	6 18 33.2	4.02	11 19 58.6	23 20 12.00	0.711	6 17 13.5	3.95
12	23 20 14.87	0.712	6 16 57.6	3.95	12 19 54.9	23 20 28.93	0.700	6 15 39.6	3.87
13	23 20 31.80	0.700	6 15 23.8	3.87	13 19 51.3	23 20 45.59	0.688	6 14 7.6	3.80
14	23 20 48.45	0.688	6 13 51.9	3.79	14 19 47.6	23 21 1.97	0.676	6 12 37.4	3.72
15	23 21 4.82	0.676	6 12 21.8	3.71	15 19 44.0	23 21 18.06	0.664	6 11 9.1	3.64
16	23 21 20.90	0.664	6 10 53.6	3.63	16 19 40.3	23 21 33.86	0.652	6 9 42.8	3.56
17	23 21 36.69	0.652	6 9 27.4	3.55	17 19 36.6	23 21 49.36	0.640	6 8 18.4	3.48
18	23 21 52.18	0.639	6 8 3.2	3.47	18 19 32.9	23 22 4.57	0.628	6 6 56.0	3.39
19	23 22 7.37	0.627	6 6 41.0	3.39	19 19 29.3	23 22 19.49	0.615	6 5 35.6	3.31
20	23 22 22.27	0.615	6 5 20.7	3.30	20 19 25.6	23 22 34.11	0.603	6 4 17.2	3.22
21	23 22 36.87	0.602	6 4 2.4	3.22	21 19 21.9	23 22 48.42	0.590	6 3 0.8	3.14
22	23 22 51.16	0.589	6 2 46.2	3.13	22 19 18.2	23 23 2.43	0.578	6 1 46.4	3.06
23	23 23 5.15	0.576	6 1 32.0	3.05	23 19 14.5	23 23 16.14	0.565	6 0 34.0	2.97
24	23 23 18.83	0.563	6 0 19.8	2.96	24 19 10.8	23 23 29.54	0.552	5 59 23.7	2.89
25	23 23 32.20	0.550	5 59 9.7	2.88	25 19 7.0	23 23 42.62	0.539	5 58 15.4	2.80
26	23 23 45.25	0.537	5 58 1.7	2.79	26 19 3.3	23 23 55.39	0.526	5 57 9.2	2.71
27	23 23 57.99	0.524	5 56 55.7	2.71	27 18 59.6	23 24 7.85	0.513	5 56 5.0	2.63
28	23 24 10.42	0.511	5 55 51.8	2.62	28 18 55.9	23 24 20.00	0.500	5 55 2.9	2.54
29	23 24 22.53	0.498	5 54 50.0	2.53	29 18 52.1	23 24 31.83	0.486	5 54 3.0	2.45
30	23 24 34.32	0.484	5 53 50.4	2.44	30 18 48.4	23 24 43.33	0.472	5 53 5.3	2.36
31	23 24 45.78	0.471	5 52 53.0	2.35	31 18 44.6	23 24 54.50	0.459	5 52 9.7	2.27
June 1	23 24 56.91	0.457	5 51 57.7	2.26	1 18 40.9	23 25 5.34	0.445	5 51 16.3	2.18
2	23 25 7.71	0.443	5 51 4.6	2.17	2 18 37.1	23 25 15.85	0.431	5 50 25.0	2.09
3	23 25 18.17	0.429	5 50 13.6	2.08	3 18 33.4	23 25 26.02	0.417	5 49 35.8	2.00
4	23 25 28.29	0.415	5 49 24.8	1.99	4 18 29.6	23 25 35.86	0.403	5 48 48.8	1.91
5	23 25 38.08	0.401	5 48 38.3	1.89	5 18 25.8	23 25 45.36	0.389	5 48 4.1	1.81
6	23 25 47.53	0.386	5 47 54.1	1.80	6 18 22.0	23 25 54.52	0.375	5 47 21.7	1.72
7	23 25 56.63	0.372	5 47 12.1	1.70	7 18 18.3	23 26 3.34	0.360	5 46 41.6	1.62
8	23 26 5.39	0.358	5 46 32.4	1.61	8 18 14.5	23 26 11.81	0.346	5 46 3.8	1.53
9	23 26 13.80	0.343	5 45 55.0	1.51	9 18 10.7	23 26 19.94	0.331	5 45 28.2	1.44
10	23 26 21.86	0.328	5 45 19.9	1.41	10 18 6.9	23 26 27.71	0.316	5 44 54.9	1.34
11	23 26 29.56	0.314	5 44 47.1	1.32	11 18 3.0	23 26 35.13	0.302	5 44 24.0	1.24
12	23 26 36.91	0.299	5 44 16.7	1.22	12 17 59.2	23 26 42.19	0.287	5 43 55.4	1.14
13	23 26 43.90	0.284	5 43 48.6	1.12	13 17 55.4	23 26 48.89	0.272	5 43 29.2	1.04
14	23 26 50.53	0.269	5 43 22.9	1.02	14 17 51.6	23 26 55.23	0.257	5 43 5.3	0.95
15	23 26 56.80	0.254	5 42 59.5	0.93	15 17 47.8	23 27 1.22	0.242	5 42 43.7	0.85
16	23 27 2.71	0.239	5 42 38.4	0.83	16 17 43.9	23 27 6.85	0.227	5 42 24.3	0.76
17	23 27 8.26	0.224	5 42 19.6	0.74	17 17 40.0	23 27 12.12	0.212	5 42 7.2	0.66
18	23 27 13.45	0.209	5 42 3.1	0.64	18 17 36.2	23 27 17.04	0.197	5 41 58.5	0.56
19	23 27 18.29	0.194	5 41 49.0	0.54	19 17 32.4	23 27 21.59	0.182	5 41 40.2	0.46
20	23 27 22.76	0.179	5 41 37.3	0.44	20 17 28.5	23 27 25.78	0.167	5 41 30.2	0.37
21	23 27 26.86	0.163	5 41 27.9	0.34	21 17 24.6	23 27 29.60	0.151	5 41 22.6	0.27
22	23 27 30.59	0.148	5 41 20.9	0.24	22 17 20.8	23 27 33.05	0.136	5 41 17.3	0.17
23	23 27 33.95	0.132	5 41 16.2	0.15	23 17 16.9	23 27 36.14	0.121	5 41 14.3	+0.08
24	23 27 36.95	0.117	5 41 13.9	+0.05	24 17 13.0	23 27 38.87	0.106	5 41 13.6	−0.02
25	23 27 39.58	0.102	5 41 13.9	−0.05	25 17 9.1	23 27 41.24	0.091	5 41 15.3	0.12
26	23 27 41.85	0.087	5 41 16.3	0.15	26 17 5.2	23 27 43.24	0.076	5 41 19.3	0.22
27	23 27 43.75	0.071	5 41 21.0	0.25	27 17 1.3	23 27 44.87	0.060	5 41 25.7	0.32
28	23 27 45.28	0.056	5 41 28.1	0.34	28 16 57.4	23 27 46.14	0.045	5 41 34.5	0.41
29	23 27 46.44	0.041	5 41 37.5	0.44	29 16 53.5	23 27 47.04	0.030	5 41 45.6	0.51
30	23 27 47.23	0.025	5 41 49.3	0.54	30 16 49.6	23 27 47.57	+0.014	5 41 59.0	0.61
31	23 27 47.65	+0.010	−5 42 3.4	−0.64	31 16 45.6	23 27 47.73	−0.001	−5 42 14.7	−0.70

SATURN, 1877.

Date. 1877.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	23 27 47.65	+0.010	−5 42 3.4	−0.64	1 16 45.6	23 27 47.73	−0.001	−5 42 14.7	−0.70
2	23 27 47.70	−0.005	5 42 19.9	0.74	2 16 41.7	23 27 47.53	0.016	5 42 32.7	0.80
3	23 27 47.39	0.021	5 42 38.7	0.83	3 16 37.7	23 27 46.96	0.031	5 42 53.1	0.90
4	23 27 46.71	0.036	5 42 59.8	0.93	4 16 33.8	23 27 46.03	0.046	5 43 15.8	0.99
5	23 27 45.66	0.051	5 43 23.3	1.03	5 16 29.8	23 27 44.73	0.062	5 43 40.8	1.09
6	23 27 44.24	0.067	5 43 49.1	1.12	6 16 25.9	23 27 43.06	0.077	5 44 8.1	1.19
7	23 27 42.45	0.082	5 44 17.2	1.22	7 16 21.9	23 27 41.02	0.093	5 44 37.7	1.28
8	23 27 40.29	0.098	5 44 47.6	1.31	8 16 17.9	23 27 38.61	0.108	5 45 9.6	1.38
9	23 27 37.75	0.113	5 45 20.3	1.41	9 16 14.0	23 27 35.83	0.123	5 45 43.7	1.47
10	23 27 34.85	0.128	5 45 55.3	1.51	10 16 10.0	23 27 32.69	0.138	5 46 20.1	1.56
11	23 27 31.59	0.144	5 46 32.6	1.60	11 16 6.0	23 27 29.19	0.153	5 46 58.8	1.66
12	23 27 27.96	0.159	5 47 12.2	1.70	12 16 2.0	23 27 25.33	0.168	5 47 39.8	1.75
13	23 27 23.97	0.174	5 47 54.0	1.79	13 15 58.0	23 27 21.11	0.183	5 48 23.0	1.85
14	23 27 19.62	0.189	5 48 38.0	1.88	14 15 54.0	23 27 16.54	0.198	5 49 8.4	1.94
15	23 27 14.91	0.204	5 49 24.2	1.97	15 15 50.0	23 27 11.61	0.213	5 49 55.9	2.02
16	23 27 9.85	0.218	5 50 12.5	2.06	16 15 46.0	23 27 6.33	0.227	5 50 45.5	2.11
17	23 27 4.44	0.233	5 51 3.0	2.15	17 15 41.9	23 27 0.71	0.241	5 51 37.3	2.20
18	23 26 58.68	0.247	5 51 55.7	2.24	18 15 37.9	23 26 54.74	0.256	5 52 31.2	2.29
19	23 26 52.57	0.262	5 52 50.5	2.32	19 15 33.9	23 26 48.43	0.270	5 53 27.1	2.37
20	23 26 46.12	0.276	5 53 47.3	2.41	20 15 29.8	23 26 41.78	0.284	5 54 25.1	2.46
21	23 26 39.33	0.290	5 54 46.1	2.49	21 15 25.8	23 26 34.79	0.298	5 55 25.1	2.54
22	23 26 32.20	0.304	5 55 47.0	2.58	22 15 21.7	23 26 27.47	0.312	5 56 27.1	2.62
23	23 26 24.74	0.318	5 56 49.9	2.66	23 15 17.7	23 26 19.81	0.326	5 57 31.1	2.71
24	23 26 16.94	0.332	5 57 54.8	2.74	24 15 13.6	23 26 11.82	0.340	5 58 37.0	2.79
25	23 26 8.81	0.345	5 59 1.6	2.82	25 15 9.5	23 26 3.51	0.353	5 59 44.8	2.86
26	23 26 0.36	0.359	6 0 10.3	2.90	26 15 5.4	23 25 54.89	0.366	6 0 54.5	2.94
27	23 25 51.60	0.372	6 1 20.9	2.98	27 15 1.4	23 25 45.96	0.379	6 2 6.1	3.02
28	23 25 42.52	0.385	6 2 33.4	3.06	28 14 57.3	23 25 36.71	0.392	6 3 19.6	3.10
29	23 25 33.13	0.398	6 3 47.8	3.14	29 14 53.2	23 25 27.15	0.405	6 4 34.9	3.17
30	23 25 23.42	0.411	6 5 4.0	3.21	30 14 49.1	23 25 17.28	0.418	6 5 51.9	3.25
31	23 25 13.41	0.424	6 6 21.9	3.28	31 14 45.0	23 25 7.10	0.430	6 7 10.7	3.32
Aug. 1	23 25 3.09	0.436	6 7 41.6	3.36	1 14 40.9	23 24 56.62	0.443	6 8 31.2	3.39
2	23 24 52.47	0.449	6 9 3.0	3.43	2 14 36.8	23 24 45.85	0.455	6 9 53.3	3.46
3	23 24 41.55	0.461	6 10 26.0	3.49	3 14 32.7	23 24 34.79	0.467	6 11 17.1	3.52
4	23 24 30.34	0.473	6 11 50.7	3.56	4 14 28.6	23 24 23.45	0.478	6 12 42.5	3.59
5	23 24 18.86	0.484	6 13 17.0	3.63	5 14 24.4	23 24 11.84	0.490	6 14 9.5	3.66
6	23 24 7.10	0.496	6 14 44.8	3.69	6 14 20.3	23 23 59.95	0.501	6 15 38.0	3.72
7	23 23 55.07	0.507	6 16 14.2	3.76	7 14 16.2	23 23 47.79	0.512	6 17 8.0	3.78
8	23 23 42.77	0.518	6 17 45.1	3.82	8 14 12.0	23 23 35.37	0.523	6 18 39.5	3.84
9	23 23 30.21	0.529	6 19 17.4	3.88	9 14 7.9	23 23 22.69	0.534	6 20 12.4	3.90
10	23 23 17.39	0.539	6 20 51.1	3.93	10 14 3.7	23 23 9.76	0.544	6 21 46.6	3.95
11	23 23 4.32	0.550	6 22 26.1	3.99	11 13 59.6	23 22 56.58	0.554	6 23 22.1	4.00
12	23 22 51.01	0.560	6 24 2.4	4.04	12 13 55.4	23 22 43.17	0.563	6 24 58.8	4.05
13	23 22 37.46	0.569	6 25 39.9	4.09	13 13 51.3	23 22 29.54	0.573	6 26 36.7	4.10
14	23 22 23.69	0.578	6 27 18.5	4.13	14 13 47.1	23 22 15.69	0.582	6 28 15.8	4.15
15	23 22 9.70	0.587	6 28 58.3	4.18	15 13 42.9	23 22 1.62	0.591	6 29 56.0	4.20
16	23 21 55.50	0.596	6 30 39.2	4.23	16 13 38.8	23 21 47.34	0.599	6 31 37.3	4.24
17	23 21 41.09	0.605	6 32 21.2	4.27	17 13 34.6	23 21 32.86	0.607	6 33 19.5	4.28
18	23 21 26.48	0.613	6 34 4.2	4.31	18 13 30.4	23 21 18.18	0.615	6 35 2.6	4.31
19	23 21 11.68	0.620	6 35 48.1	4.35	19 13 26.2	23 21 3.32	0.623	6 36 46.5	4.35
20	23 20 56.70	0.628	6 37 32.8	4.38	20 13 22.0	23 20 48.28	0.630	6 38 31.3	4.39
21	23 20 41.54	0.635	6 39 18.3	4.41	21 13 17.9	23 20 33.07	0.637	6 40 17.0	4.42
22	23 20 26.21	0.642	6 41 4.6	4.45	22 13 13.7	23 20 17.69	0.644	6 42 3.5	4.45
23	23 20 10.71	0.649	6 42 51.7	4.48	23 13 9.5	23 20 2.15	0.651	6 43 50.7	4.48
24	23 19 55.06	0.655	6 44 39.5	4.50	24 13 5.3	23 19 46.46	0.656	6 45 38.5	4.50
25	23 19 39.27	0.661	6 46 27.9	4.53	25 13 1.1	23 19 30.64	0.662	6 47 26.8	4.53
26	23 19 23.34	0.666	6 48 16.8	4.55	26 12 56.9	23 19 14.69	0.667	6 49 15.7	4.55
27	23 19 7.28	0.672	6 50 6.2	4.57	27 12 52.7	23 18 58.61	0.673	6 51 5.1	4.57
28	23 18 51.09	0.677	6 51 56.1	4.59	28 12 48.5	23 18 42.40	0.678	6 52 54.9	4.58
29	23 18 34.78	0.682	6 53 46.4	4.60	29 12 44.3	23 18 26.08	0.682	6 54 45.1	4.60
30	23 18 18.36	0.686	6 55 37.0	4.62	30 12 40.1	23 18 9.66	0.686	6 56 35.6	4.61
31	23 18 1.85	−0.690	−6 57 28.0	−4.63	31 12 35.9	23 17 53.15	−0.690	−6 58 26.4	−4.62

SATURN, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	23 17 45.25	−0.694	−6 59 19.3	−4.64	1 12 31.7	23 17 36.55	−0.694	−7 0 17.5	−4.63
2	23 17 28.56	0.697	7 1 10.8	4.65	2 12 27.5	23 17 19.86	0.697	7 2 8.7	4.64
3	23 17 11.79	0.700	7 3 2.4	4.65	3 12 23.3	23 17 3.11	0.699	7 4 0.0	4.64
4	23 16 54.96	0.702	7 4 54.0	4.65	4 12 19.1	23 16 46.30	0.701	7 5 51.3	4.64
5	23 16 38.08	0.704	7 6 45.6	4.65	5 12 14.8	23 16 29.45	0.703	7 7 42.5	4.63
6	23 16 21.16	0.706	7 8 37.1	4.64	6 12 10.6	23 16 12.57	0.704	7 9 33.6	4.63
7	23 16 4.21	0.707	7 10 28.5	4.64	7 12 6.4	23 15 55.65	0.706	7 11 24.6	4.62
8	23 15 47.23	0.708	7 12 19.7	4.63	8 12 2.2	23 15 38.70	0.707	7 13 15.4	4.61
9	23 15 30.22	0.709	7 14 10.7	4.62	9 11 58.0	23 15 21.73	0.707	7 15 6.9	4.60
10	23 15 13.20	0.709	7 16 1.4	4.61	10 11 53.8	23 15 4.76	0.707	7 16 56.2	4.59
11	23 14 56.18	0.708	7 17 51.8	4.59	11 11 49.6	23 14 47.80	0.706	7 18 46.1	4.57
12	23 14 39.18	0.708	7 19 41.8	4.57	12 11 45.3	23 14 30.86	0.705	7 20 35.5	4.55
13	23 14 22.20	0.707	7 21 31.3	4.55	13 11 41.1	23 14 13.94	0.704	7 22 24.4	4.52
14	23 14 5.25	0.705	7 23 20.2	4.52	14 11 36.9	23 13 57.06	0.703	7 24 12.7	4.50
15	23 13 48.34	0.704	7 25 8.4	4.50	15 11 32.7	23 13 40.22	0.701	7 26 0.3	4.47
16	23 13 31.47	0.702	7 26 56.0	4.47	16 11 28.5	23 13 23.42	0.699	7 27 47.2	4.44
17	23 13 14.65	0.699	7 28 42.8	4.44	17 11 24.3	23 13 6.68	0.696	7 29 33.3	4.40
18	23 12 57.90	0.696	7 30 28.9	4.40	18 11 20.1	23 12 50.01	0.693	7 31 18.6	4.37
19	23 12 41.23	0.693	7 32 14.2	4.37	19 11 15.9	23 12 33.43	0.689	7 33 3.2	4.34
20	23 12 24.65	0.689	7 33 58.7	4.34	20 11 11.7	23 12 16.94	0.685	7 34 47.0	4.31
21	23 12 8.16	0.685	7 35 42.3	4.30	21 11 7.5	23 12 0.55	0.681	7 36 29.9	4.27
22	23 11 51.77	0.681	7 37 24.9	4.25	22 11 3.3	23 11 44.26	0.676	7 38 11.8	4.22
23	23 11 35.49	0.676	7 39 6.5	4.21	23 10 59.1	23 11 28.08	0.672	7 39 52.7	4.18
24	23 11 19.32	0.671	7 40 47.0	4.16	24 10 54.9	23 11 12.02	0.667	7 41 32.4	4.13
25	23 11 3.28	0.666	7 42 26.4	4.12	25 10 50.7	23 10 56.08	0.661	7 43 10.9	4.08
26	23 10 47.37	0.660	7 44 4.6	4.07	26 10 46.5	23 10 40.27	0.656	7 44 48.2	4.03
27	23 10 31.59	0.654	7 45 41.5	4.01	27 10 42.3	23 10 24.60	0.650	7 46 24.3	3.98
28	23 10 15.96	0.648	7 47 17.2	3.96	28 10 38.1	23 10 9.09	0.643	7 47 59.2	3.92
29	23 10 0.50	0.641	7 48 51.6	3.90	29 10 33.9	23 9 53.75	0.636	7 49 32.7	3.87
30	23 9 45.21	0.634	7 50 24.6	3.85	30 10 29.7	23 9 38.58	0.629	7 51 4.8	3.81
Oct. 1	23 9 30.09	0.626	7 51 56.2	3.79	1 10 25.5	23 9 23.58	0.621	7 52 35.5	3.75
2	23 9 15.15	0.619	7 53 26.3	3.72	2 10 21.4	23 9 8.76	0.613	7 54 4.7	3.69
3	23 9 0.40	0.610	7 54 54.9	3.66	3 10 17.2	23 8 54.14	0.605	7 55 32.4	3.62
4	23 8 45.86	0.601	7 56 22.0	3.60	4 10 13.0	23 8 39.73	0.596	7 56 58.5	3.55
5	23 8 31.53	0.593	7 57 47.5	3.53	5 10 8.9	23 8 25.53	0.587	7 58 23.0	3.49
6	23 8 17.41	0.584	7 59 11.3	3.46	6 10 4.7	23 8 11.54	0.578	7 59 45.9	3.42
7	23 8 3.51	0.574	8 0 33.4	3.39	7 10 0.5	23 7 57.78	0.569	8 1 7.1	3.35
8	23 7 49.84	0.564	8 1 53.8	3.31	8 9 56.4	23 7 44.25	0.559	8 2 26.5	3.27
9	23 7 36.42	0.554	8 3 12.4	3.24	9 9 52.2	23 7 30.97	0.548	8 3 44.1	3.20
10	23 7 23.25	0.544	8 4 29.1	3.16	10 9 48.1	23 7 17.94	0.538	8 4 59.9	3.12
11	23 7 10.33	0.533	8 5 44.0	3.08	11 9 43.9	23 7 5.16	0.527	8 6 13.8	3.04
12	23 6 57.67	0.522	8 6 57.0	3.00	12 9 39.8	23 6 52.65	0.516	8 7 25.8	2.96
13	23 6 45.28	0.510	8 8 8.1	2.92	13 9 35.7	23 6 40.41	0.504	8 8 35.9	2.88
14	23 6 33.17	0.499	8 9 17.2	2.84	14 9 31.5	23 6 28.45	0.492	8 9 44.0	2.80
15	23 6 21.34	0.487	8 10 24.2	2.75	15 9 27.4	23 6 16.77	0.481	8 10 50.1	2.71
16	23 6 9.80	0.475	8 11 29.2	2.66	16 9 23.3	23 6 5.37	0.469	8 11 54.1	2.62
17	23 5 58.55	0.462	8 12 32.1	2.58	17 9 19.2	23 5 54.26	0.457	8 12 56.0	2.54
18	23 5 47.60	0.450	8 13 32.9	2.49	18 9 15.0	23 5 43.45	0.444	8 13 55.8	2.45
19	23 5 36.95	0.437	8 14 31.6	2.40	19 9 10.9	23 5 32.95	0.431	8 14 53.5	2.36
20	23 5 26.61	0.424	8 15 28.2	2.31	20 9 6.8	23 5 22.76	0.418	8 15 49.1	2.27
21	23 5 16.58	0.411	8 16 22.6	2.22	21 9 2.7	23 5 12.88	0.405	8 16 42.6	2.18
22	23 5 6.86	0.398	8 17 14.9	2.13	22 8 58.6	23 5 3.31	0.392	8 17 33.9	2.09
23	23 4 57.47	0.384	8 18 5.0	2.04	23 8 54.6	23 4 54.07	0.378	8 18 23.0	2.00
24	23 4 48.41	0.371	8 18 52.8	1.94	24 8 50.5	23 4 45.16	0.364	8 19 9.8	1.90
25	23 4 39.68	0.357	8 19 38.3	1.85	25 8 46.4	23 4 36.58	0.350	8 19 54.4	1.81
26	23 4 31.29	0.342	8 20 21.5	1.75	26 8 42.3	23 4 28.34	0.336	8 20 36.7	1.71
27	23 4 23.25	0.328	8 21 2.5	1.66	27 8 38.3	23 4 20.44	0.322	8 21 16.7	1.62
28	23 4 15.55	0.314	8 21 41.2	1.56	28 8 34.2	23 4 12.88	0.308	8 21 54.4	1.52
29	23 4 8.20	0.299	8 22 17.5	1.46	29 8 30.2	23 4 5.67	0.293	8 22 29.7	1.42
30	23 4 1.20	0.284	8 22 51.4	1.36	30 8 26.1	23 3 58.81	0.278	8 23 2.7	1.33
31	23 3 54.55	0.270	8 23 23.0	1.27	31 8 22.1	23 3 52.31	0.263	8 23 33.4	1.23
32	23 3 48.26	−0.254	−8 23 52.2	−1.17	32 8 18.0	23 3 46.17	−0.248	−8 24 1.7	−1.13

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	23 3 48.26	–0.254	–8 23 52.2	–1.17	1 8 18.0	23 3 46.17	–0.248	–8 24 1.7	–1.13
2	23 3 42.34	0.239	8 24 19.0	1.06	2 8 14.0	23 3 40.40	0.233	8 24 27.6	1.03
3	23 3 36.80	0.223	8 24 43.3	0.96	3 8 10.0	23 3 35.00	0.217	8 24 51.0	0.92
4	23 3 31.63	0.207	8 25 5.2	0.86	4 8 6.0	23 3 29.97	0.202	8 25 12.0	0.82
5	23 3 26.84	0.192	8 25 24.6	0.76	5 8 2.0	23 3 25.32	0.186	8 25 30.5	0.72
6	23 3 22.43	0.176	8 25 41.5	0.65	6 7 58.0	23 3 21.05	0.170	8 25 46.6	0.62
7	23 3 18.40	0.160	8 25 55.9	0.55	7 7 54.0	23 3 17.16	0.154	8 26 0.2	0.51
8	23 3 14.75	0.144	8 26 7.8	0.45	8 7 50.0	23 3 13.65	0.138	8 26 11.3	0.41
9	23 3 11.49	0.128	8 26 17.3	0.34	9 7 46.0	23 3 10.52	0.122	8 26 19.9	0.31
10	23 3 8.61	0.112	8 26 24.3	0.24	10 7 42.0	23 3 7.77	0.106	8 26 26.0	0.20
11	23 3 6.12	0.096	8 26 28.8	0.14	11 7 38.0	23 3 5.41	0.090	8 26 29.7	–0.10
12	23 3 4.02	0.079	8 26 30.8	–0.03	12 7 34.1	23 3 3.44	0.074	8 26 30.9	0.00
13	23 3 2.31	0.063	8 26 30.3	+0.07	13 7 30.1	23 3 1.86	0.058	8 26 29.6	+0.11
14	23 3 1.00	0.046	8 26 27.2	0.18	14 7 26.2	23 3 0.67	0.041	8 26 25.8	0.21
15	23 3 0.08	0.030	8 26 21.6	0.29	15 7 22.2	23 2 59.87	0.025	8 26 19.4	0.32
16	23 2 59.55	–0.014	8 26 13.5	0.39	16 7 18.3	23 2 59.47	–0.009	8 26 10.5	0.42
17	23 2 59.42	+0.003	8 26 2.9	0.49	17 7 14.4	23 2 59.46	+0.008	8 25 59.2	0.52
18	23 2 59.68	0.019	8 25 49.8	0.60	18 7 10.4	23 2 59.84	0.024	8 25 45.4	0.62
19	23 3 0.34	0.036	8 25 34.3	0.70	19 7 6.5	23 3 0.61	0.040	8 25 29.2	0.73
20	23 3 1.39	0.052	8 25 16.3	0.80	20 7 2.6	23 3 1.78	0.057	8 25 10.5	0.83
21	23 3 2.84	0.069	8 24 55.8	0.91	21 6 58.7	23 3 3.34	0.073	8 24 49.4	0.93
22	23 3 4.68	0.085	8 24 32.8	1.01	22 6 54.8	23 3 5.29	0.089	8 24 25.8	1.04
23	23 3 6.92	0.101	8 24 7.4	1.11	23 6 50.9	23 3 7.63	0.106	8 23 59.7	1.14
24	23 3 9.55	0.118	8 23 39.5	1.21	24 6 47.0	23 3 10.37	0.122	8 23 31.2	1.24
25	23 3 12.58	0.134	8 23 9.1	1.32	25 6 43.1	23 3 13.50	0.139	8 23 0.2	1.34
26	23 3 16.00	0.151	8 22 36.3	1.42	26 6 39.3	23 3 17.02	0.155	8 22 26.8	1.45
27	23 3 19.81	0.167	8 22 1.0	1.52	27 6 35.4	23 3 20.93	0.171	8 21 50.9	1.55
28	23 3 24.01	0.183	8 21 23.3	1.62	28 6 31.5	23 3 25.22	0.187	8 21 12.6	1.65
29	23 3 28.61	0.200	8 20 43.2	1.72	29 6 27.7	23 3 29.91	0.204	8 20 31.9	1.75
30	23 3 33.60	0.216	8 20 0.6	1.82	30 6 23.8	23 3 34.99	0.220	8 19 48.8	1.85
Dec. 1	23 3 38.98	0.232	8 19 15.6	1.93	1 6 20.0	23 3 40.46	0.236	8 19 3.3	1.95
2	23 3 44.75	0.249	8 18 28.1	2.03	2 6 16.2	23 3 46.32	0.252	8 18 15.3	2.05
3	23 3 50.91	0.265	8 17 38.2	2.13	3 6 12.3	23 3 52.56	0.268	8 17 24.9	2.15
4	23 3 57.46	0.281	8 16 45.9	2.23	4 6 8.5	23 3 59.19	0.284	8 16 32.2	2.24
5	23 4 4.39	0.297	8 15 51.3	2.32	5 6 4.7	23 4 6.20	0.300	8 15 37.2	2.34
6	23 4 11.71	0.313	8 14 54.4	2.42	6 6 0.9	23 4 13.60	0.316	8 14 39.8	2.44
7	23 4 19.41	0.329	8 13 55.1	2.52	7 5 57.1	23 4 21.38	0.332	8 13 40.1	2.54
8	23 4 27.49	0.345	8 12 53.4	2.62	8 5 53.3	23 4 29.53	0.348	8 12 38.0	2.64
9	23 4 35.95	0.360	8 11 49.4	2.71	9 5 49.5	23 4 38.06	0.363	8 11 33.6	2.73
10	23 4 44.79	0.376	8 10 43.1	2.81	10 5 45.7	23 4 46.97	0.379	8 10 26.9	2.83
11	23 4 54.01	0.392	8 9 34.5	2.91	11 5 41.9	23 4 56.25	0.394	8 9 17.9	2.92
12	23 5 3.60	0.407	8 8 23.6	3.00	12 5 38.2	23 5 5.90	0.410	8 8 6.7	3.01
13	23 5 13.55	0.422	8 7 10.5	3.09	13 5 34.4	23 5 15.91	0.425	8 6 53.3	3.10
14	23 5 23.86	0.437	8 5 55.2	3.18	14 5 30.6	23 5 26.28	0.440	8 5 37.7	3.20
15	23 5 34.53	0.452	8 4 37.7	3.27	15 5 26.9	23 5 37.00	0.454	8 4 19.9	3.29
16	23 5 45.56	0.467	8 3 18.1	3.36	16 5 23.1	23 5 48.08	0.469	8 2 59.9	3.38
17	23 5 56.95	0.482	8 1 56.3	3.45	17 5 19.4	23 5 59.52	0.484	8 1 37.8	3.46
18	23 6 8.69	0.496	8 0 32.4	3.54	18 5 15.7	23 6 11.31	0.498	8 0 13.6	3.55
19	23 6 20.78	0.511	7 59 6.3	3.63	19 5 11.9	23 6 23.44	0.513	7 58 47.3	3.64
20	23 6 33.21	0.525	7 57 38.1	3.72	20 5 8.2	23 6 35.92	0.527	7 57 18.9	3.73
21	23 6 45.99	0.540	7 56 7.8	3.80	21 5 4.5	23 6 48.74	0.541	7 55 48.4	3.81
22	23 6 59.11	0.554	7 54 35.5	3.89	22 5 0.8	23 7 1.89	0.555	7 54 15.9	3.90
23	23 7 12.56	0.567	7 53 1.2	3.97	23 4 57.1	23 7 15.37	0.569	7 52 41.3	3.98
24	23 7 26.34	0.581	7 51 24.8	4.06	24 4 53.4	23 7 29.19	0.583	7 51 4.7	4.06
25	23 7 40.45	0.595	7 49 46.4	4.14	25 4 49.7	23 7 43.34	0.596	7 49 26.2	4.14
26	23 7 54.90	0.609	7 48 6.0	4.22	26 4 46.0	23 7 57.81	0.610	7 47 45.8	4.22
27	23 8 9.67	0.622	7 46 23.7	4.30	27 4 42.3	23 8 12.60	0.623	7 46 3.4	4.31
28	23 8 24.76	0.635	7 44 39.5	4.38	28 4 38.6	23 8 27.71	0.636	7 44 19.0	4.39
29	23 8 40.17	0.649	7 42 53.3	4.46	29 4 34.9	23 8 43.14	0.650	7 42 32.7	4.47
30	23 8 55.90	0.662	7 41 5.2	4.54	30 4 31.3	23 8 58.89	0.663	7 40 44.6	4.54
31	23 9 11.94	0.675	7 39 15.3	4.62	31 4 27.6	23 9 14.95	0.676	7 38 54.7	4.62
32	23 9 28.29	+0.688	–7 37 23.5	+4.70	32 4 23.9	23 9 31.32	+0.688	–7 37 2.9	+4.70

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	9 47 20.59	−0.266	+14 8 55.4	+1.46	0 15 2.9	9 47 16.55	−0.270	+14 9 17.4	+1.48
1	9 47 14.12	0.273	14 9 30.8	1.49	1 14 58.9	9 47 10.00	0.276	14 9 53.3	1.51
2	9 47 7.49	0.280	14 10 7.0	1.53	2 14 54.9	9 47 3.29	0.283	14 10 30.0	1.55
3	9 47 0.69	0.286	14 10 44.1	1.56	3 14 50.9	9 46 56.42	0.290	14 11 7.5	1.58
4	9 46 53.72	0.294	14 11 21.9	1.59	4 14 46.8	9 46 49.38	0.297	14 11 45.7	1.61
5	9 46 46.60	0.300	14 12 0.5	1.62	5 14 42.8	9 46 42.18	0.304	14 12 24.6	1.64
6	9 46 39.32	0.306	14 12 39.8	1.65	6 14 38.7	9 46 34.82	0.310	14 13 4.2	1.67
7	9 46 31.89	0.312	14 13 19.9	1.68	7 14 34.7	9 46 27.32	0.315	14 13 44.7	1.70
8	9 46 24.30	0.318	14 14 0.7	1.71	8 14 30.6	9 46 19.66	0.321	14 14 25.8	1.73
9	9 46 16.56	0.324	14 14 42.2	1.74	9 14 26.5	9 46 11.86	0.327	14 15 7.6	1.75
10	9 46 8.69	0.330	14 15 24.4	1.77	10 14 22.4	9 46 3.92	0.333	14 15 50.0	1.78
11	9 46 0.68	0.336	14 16 7.2	1.80	11 14 18.4	9 45 55.85	0.339	14 16 33.1	1.81
12	9 45 52.53	0.342	14 16 50.6	1.82	12 14 14.3	9 45 47.64	0.345	14 17 16.8	1.83
13	9 45 44.25	0.348	14 17 34.7	1.85	13 14 10.2	9 45 39.30	0.350	14 18 1.1	1.86
14	9 45 35.83	0.353	14 18 19.4	1.87	14 14 6.1	9 45 30.83	0.355	14 18 46.0	1.88
15	9 45 27.30	0.358	14 19 4.6	1.90	15 14 2.0	9 45 22.25	0.360	14 19 31.4	1.90
16	9 45 18.65	0.363	14 19 50.4	1.92	16 13 58.0	9 45 13.55	0.365	14 20 17.4	1.93
17	9 45 9.88	0.368	14 20 36.7	1.94	17 13 53.9	9 45 4.74	0.369	14 21 3.9	1.95
18	9 45 0.99	0.372	14 21 23.5	1.96	18 13 49.8	9 44 55.82	0.374	14 21 50.8	1.96
19	9 44 52.00	0.377	14 22 10.8	1.98	19 13 45.7	9 44 46.79	0.378	14 22 38.2	1.98
20	9 44 42.90	0.381	14 22 58.6	2.00	20 13 41.6	9 44 37.67	0.382	14 23 26.1	2.00
21	9 44 33.71	0.385	14 23 46.8	2.02	21 13 37.6	9 44 28.45	0.386	14 24 14.4	2.02
22	9 44 24.43	0.389	14 24 35.4	2.03	22 13 33.5	9 44 19.14	0.390	14 25 3.1	2.03
23	9 44 15.03	0.393	14 25 24.4	2.05	23 13 29.4	9 44 9.73	0.394	14 25 52.1	2.05
24	9 44 5.55	0.397	14 26 13.8	2.06	24 13 25.3	9 44 0.23	0.397	14 26 41.5	2.06
25	9 43 56.00	0.400	14 27 3.5	2.08	25 13 21.3	9 43 50.66	0.401	14 27 31.2	2.08
26	9 43 46.37	0.403	14 27 53.4	2.09	26 13 17.2	9 43 41.01	0.404	14 28 21.2	2.09
27	9 43 36.66	0.406	14 28 43.7	2.10	27 13 13.1	9 43 31.30	0.407	14 29 11.5	2.10
28	9 43 26.88	0.409	14 29 34.3	2.11	28 13 9.0	9 43 21.51	0.410	14 30 2.1	2.11
29	9 43 17.03	0.412	14 30 25.2	2.12	29 13 4.9	9 43 11.65	0.412	14 30 52.9	2.12
30	9 43 7.13	0.414	14 31 16.2	2.13	30 13 0.8	9 43 1.74	0.414	14 31 43.9	2.13
31	9 42 57.17	0.416	14 32 7.5	2.14	31 12 56.7	9 42 51.78	0.416	14 32 35.1	2.14
Feb. 1	9 42 47.16	0.418	14 32 58.9	2.15	1 12 52.6	9 42 41.77	0.418	14 33 26.5	2.15
2	9 42 37.10	0.420	14 33 50.5	2.15	2 12 48.5	9 42 31.71	0.420	14 34 18.0	2.15
3	9 42 26.99	0.422	14 34 42.3	2.16	3 12 44.4	9 42 21.61	0.422	14 35 9.7	2.15
4	9 42 16.85	0.423	14 35 34.1	2.16	4 12 40.3	9 42 11.48	0.423	14 36 1.4	2.16
5	9 42 6.68	0.425	14 36 26.0	2.17	5 12 36.2	9 42 1.33	0.424	14 36 53.2	2.16
6	9 41 56.47	0.426	14 37 18.0	2.17	6 12 32.1	9 41 51.14	0.425	14 37 45.1	2.17
7	9 41 46.24	0.427	14 38 10.1	2.17	7 12 28.0	9 41 40.92	0.426	14 38 37.1	2.17
8	9 41 35.98	0.428	14 39 2.2	2.17	8 12 23.9	9 41 30.68	0.427	14 39 29.1	2.17
9	9 41 25.71	0.429	14 39 54.3	2.17	9 12 19.8	9 41 20.43	0.428	14 40 21.1	2.17
10	9 41 15.43	0.429	14 40 46.3	2.17	10 12 15.7	9 41 10.17	0.428	14 41 12.9	2.16
11	9 41 5.14	0.429	14 41 38.3	2.17	11 12 11.5	9 40 59.90	0.428	14 42 4.7	2.16
12	9 40 54.85	0.429	14 42 30.2	2.16	12 12 7.4	9 40 49.64	0.428	14 42 56.4	2.15
13	9 40 44.56	0.428	14 43 22.0	2.16	13 12 3.3	9 40 39.38	0.427	14 43 48.0	2.15
14	9 40 34.29	0.428	14 44 13.7	2.15	14 11 59.2	9 40 29.14	0.427	14 44 39.5	2.14
15	9 40 24.03	0.427	14 45 5.2	2.15	15 11 55.1	9 40 18.92	0.426	14 45 30.8	2.13
16	9 40 13.79	0.427	14 45 56.6	2.14	16 11 51.0	9 40 8.72	0.426	14 46 22.0	2.13
17	9 40 3.56	0.426	14 46 47.8	2.13	17 11 46.9	9 39 58.53	0.425	14 47 13.0	2.12
18	9 39 53.35	0.425	14 47 38.8	2.11	18 11 42.8	9 39 48.36	0.423	14 48 3.7	2.10
19	9 39 43.19	0.424	14 48 29.4	2.10	19 11 38.7	9 39 38.24	0.421	14 48 54.0	[illegible]
20	9 39 33.06	0.421	14 49 19.8	2.09	20 11 34.6	9 39 28.16	0.419	14 49 44.1	[illegible]
21	9 39 22.98	0.420	14 50 10.0	2.08	21 11 30.5	9 39 18.12	0.418	14 50 34.0	[illegible]
22	9 39 12.93	0.418	14 50 59.8	2.07	22 11 26.4	9 39 8.12	0.416	14 51 23.5	[illegible]
23	9 39 2.94	0.416	14 51 49.3	2.05	23 11 22.3	9 38 58.19	0.414	14 52 12.7	[illegible]
24	9 38 53.01	0.413	14 52 38.4	2.04	24 11 18.2	9 38 48.31	0.411	14 53 1.5	[illegible]
25	9 38 43.14	0.410	14 53 27.1	2.02	25 11 14.1	9 38 38.50	0.408	14 53 49.9	[illegible]
26	9 38 33.33	0.408	14 54 15.5	2.01	26 11 10.0	9 38 28.76	0.405	14 54 37.9	[illegible]
27	9 38 23.60	0.405	14 55 3.4	1.99	27 11 5.9	9 38 19.10	0.402	14 55 25.5	[illegible]
28	9 38 13.93	0.402	14 55 50.9	1.97	28 11 1.8	9 38 9.49	0.399	14 56 12.7	[illegible]
29	9 38 4.33	−0.398	+14 56 38.0	+1.95	29 10 57.7	9 37 59.96	−0.395	+14 56 59.4	[illegible]

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	9 38 4.33	−0.398	+14 56 38.0	+1.95	1 10 57.7	9 37 59.96	−0.395	+14 56 59.4	+1.94
2	9 37 54.82	0.395	14 57 24.5	1.93	2 10 53.5	9 37 50.52	0.392	14 57 45.6	1.91
3	9 37 45.40	0.392	14 58 10.5	1.91	3 10 49.4	9 37 41.16	0.388	14 58 31.2	1.89
4	9 37 36.05	0.389	14 58 56.1	1.89	4 10 45.3	9 37 31.88	0.385	14 59 16.4	1.87
5	9 37 26.79	0.385	14 59 41.1	1.87	5 10 41.2	9 37 22.69	0.381	15 0 1.0	1.85
6	9 37 17.64	0.380	15 0 25.5	1.84	6 10 37.1	9 37 13.62	0.376	15 0 45.1	1.82
7	9 37 8.59	0.375	15 1 9.4	1.81	7 10 33.0	9 37 4.64	0.372	15 1 28.6	1.80
8	9 36 59.64	0.371	15 1 52.7	1.79	8 10 28.9	9 36 55.77	0.367	15 2 11.5	1.78
9	9 36 50.79	0.366	15 2 35.4	1.76	9 10 24.8	9 36 47.00	0.363	15 2 53.8	1.75
10	9 36 42.05	0.361	15 3 17.5	1.74	10 10 20.7	9 36 38.34	0.358	15 3 35.5	1.73
11	9 36 33.44	0.356	15 3 59.0	1.71	11 10 16.5	9 36 29.80	0.353	15 4 16.6	1.70
12	9 36 24.95	0.351	15 4 39.8	1.69	12 10 12.4	9 36 21.38	0.348	15 4 57.0	1.68
13	9 36 16.58	0.346	15 5 19.9	1.66	13 10 8.3	9 36 13.09	0.343	15 5 36.7	1.65
14	9 36 8.33	0.341	15 5 59.4	1.63	14 10 4.2	9 36 4.92	0.337	15 6 15.8	1.61
15	9 36 0.21	0.335	15 6 38.1	1.60	15 10 0.1	9 35 56.88	0.332	15 6 54.1	1.58
16	9 35 52.23	0.329	15 7 16.1	1.57	16 9 56.0	9 35 48.98	0.326	15 7 31.7	1.55
17	9 35 44.40	0.323	15 7 53.3	1.54	17 9 52.0	9 35 41.23	0.320	15 8 8.5	1.52
18	9 35 36.70	0.317	15 8 29.8	1.50	18 9 47.9	9 35 33.61	0.314	15 8 44.6	1.48
19	9 35 29.15	0.311	15 9 5.5	1.47	19 9 43.9	9 35 26.14	0.309	15 9 19.8	1.45
20	9 35 21.75	0.306	15 9 40.4	1.44	20 9 39.9	9 35 18.82	0.302	15 9 54.3	1.42
21	9 35 14.50	0.299	15 10 14.5	1.40	21 9 35.9	9 35 11.65	0.296	15 10 28.0	1.38
22	9 35 7.41	0.292	15 10 47.8	1.37	22 9 31.8	9 35 4.64	0.289	15 11 0.8	1.35
23	9 35 0.48	0.286	15 11 20.3	1.33	23 9 27.8	9 34 57.79	0.282	15 11 32.9	1.32
24	9 34 53.71	0.279	15 11 51.9	1.30	24 9 23.8	9 34 51.10	0.276	15 12 4.1	1.28
25	9 34 47.09	0.272	15 12 22.7	1.26	25 9 19.8	9 34 44.57	0.269	15 12 34.5	1.24
26	9 34 40.64	0.265	15 12 52.6	1.23	26 9 15.9	9 34 38.20	0.262	15 13 3.9	1.21
27	9 34 34.36	0.258	15 13 21.6	1.19	27 9 11.9	9 34 32.01	0.255	15 13 32.5	1.17
28	9 34 28.25	0.251	15 13 49.8	1.15	28 9 7.9	9 34 25.98	0.248	15 14 0.3	1.14
29	9 34 22.31	0.244	15 14 17.1	1.12	29 9 4.0	9 34 20.12	0.240	15 14 27.2	1.10
30	9 34 16.54	0.236	15 14 43.5	1.08	30 9 0.0	9 34 14.44	0.233	15 14 53.2	1.06
31	9 34 10.96	0.229	15 15 9.0	1.04	31 8 56.0	9 34 8.94	0.225	15 15 18.3	1.02
Apr. 1	9 34 5.55	0.221	15 15 33.5	1.00	1 8 52.0	9 34 3.61	0.218	15 15 42.4	0.99
2	9 34 0.32	0.214	15 15 57.2	0.97	2 8 48.0	9 33 58.46	0.210	15 16 5.7	0.95
3	9 33 55.28	0.206	15 16 19.9	0.93	3 8 44.0	9 33 53.50	0.202	15 16 28.0	0.91
4	9 33 50.42	0.198	15 16 41.7	0.89	4 8 40.0	9 33 48.71	0.194	15 16 49.4	0.87
5	9 33 45.76	0.190	15 17 2.5	0.85	5 8 36.0	9 33 44.13	0.187	15 17 9.8	0.83
6	9 33 41.29	0.183	15 17 22.4	0.81	6 8 32.0	9 33 39.73	0.180	15 17 29.3	0.79
7	9 33 37.00	0.175	15 17 41.3	0.77	7 8 28.0	9 33 35.53	0.171	15 17 47.8	0.75
8	9 33 32.91	0.167	15 17 59.3	0.73	8 8 24.0	9 33 31.52	0.163	15 18 5.4	0.71
9	9 33 29.02	0.158	15 18 16.3	0.69	9 8 20.0	9 33 27.71	0.155	15 18 22.0	0.67
10	9 33 25.32	0.150	15 18 32.3	0.65	10 8 16.0	9 33 24.09	0.147	15 18 37.6	0.63
11	9 33 21.83	0.142	15 18 47.2	0.60	11 8 12.0	9 33 20.67	0.138	15 18 52.1	0.59
12	9 33 18.53	0.133	15 19 1.2	0.56	12 8 8.0	9 33 17.45	0.130	15 19 5.7	0.55
13	9 33 15.43	0.125	15 19 14.2	0.52	13 8 4.0	9 33 14.43	0.122	15 19 18.4	0.51
14	9 33 12.53	0.117	15 19 26.2	0.48	14 8 0.0	9 33 11.61	0.113	15 19 30.0	0.46
15	9 33 9.84	0.108	15 19 37.1	0.44	15 7 56.1	9 33 8.99	0.104	15 19 40.6	0.42
16	9 33 7.36	0.099	15 19 47.1	0.40	16 7 52.1	9 33 6.59	0.096	15 19 50.2	0.38
17	9 33 5.08	0.091	15 19 56.0	0.35	17 7 48.1	9 33 4.39	0.087	15 19 58.8	0.34
18	9 33 3.00	0.082	15 20 3.9	0.31	18 7 44.2	9 33 2.38	0.079	15 20 6.3	0.29
19	9 33 1.14	0.073	15 20 10.7	0.26	19 7 40.2	9 33 0.59	0.070	15 20 12.7	0.25
20	9 32 59.48	0.064	15 20 16.5	0.22	20 7 36.2	9 32 59.00	0.062	15 20 18.1	0.21
21	9 32 58.04	0.056	15 20 21.2	0.17	21 7 32.3	9 32 57.62	0.053	15 20 22.5	0.16
22	9 32 56.80	0.047	15 20 24.9	0.13	22 7 28.3	9 32 56.46	0.044	15 20 25.9	0.12
23	9 32 55.77	0.038	15 20 27.6	0.09	23 7 24.4	9 32 55.50	0.036	15 20 28.3	0.08
24	9 32 54.96	0.030	15 20 29.3	0.05	24 7 20.4	9 32 54.76	0.027	15 20 29.6	+0.03
25	9 32 54.35	0.021	15 20 29.9	+0.01	25 7 16.5	9 32 54.22	0.018	15 20 29.9	−0.01
26	9 32 53.96	0.012	15 20 29.5	−0.04	26 7 12.5	9 32 53.89	0.009	15 20 29.2	0.05
27	9 32 53.77	−0.003	15 20 28.1	0.08	27 7 8.6	9 32 53.76	−0.001	15 20 27.5	0.09
28	9 32 53.80	+0.006	15 20 25.6	0.12	28 7 4.6	9 32 53.85	+0.008	15 20 24.7	0.14
29	9 32 54.04	0.015	15 20 22.1	0.17	29 7 0.7	9 32 54.15	0.017	15 20 20.9	0.18
30	9 32 54.49	0.023	15 20 17.6	0.21	30 6 56.8	9 32 54.66	0.026	15 20 16.1	0.22
31	9 32 55.15	+0.032	+15 20 12.1	−0.25	31 6 52.8	9 32 55.38	+0.035	+15 20 10.3	−0.26

URANUS, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	9 32 55.15	+0.032	+15 20 12.1	−0.25	1 6 52.8	9 32 55.38	+0.035	+15 20 10.3	−0.26
2	9 32 56.03	0.041	15 20 5.5	0.29	2 6 48.9	9 32 56.32	0.044	15 20 3.4	0.31
3	9 32 57.11	0.050	15 19 57.9	0.34	3 6 45.0	9 32 57.46	0.052	15 19 55.5	0.35
4	9 32 58.41	0.059	15 19 49.2	0.38	4 6 41.1	9 32 58.82	0.061	15 19 46.6	0.39
5	9 32 59.92	0.067	15 19 39.5	0.42	5 6 37.2	9 33 0.38	0.069	15 19 36.7	0.44
6	9 33 1.64	0.075	15 19 28.8	0.47	6 6 33.2	9 33 2.15	0.078	15 19 25.7	0.48
7	9 33 3.57	0.084	15 19 17.1	0.51	7 6 29.3	9 33 4.13	0.086	15 19 13.8	0.52
8	9 33 5.71	0.093	15 19 4.3	0.55	8 6 25.5	9 33 6.32	0.096	15 19 0.8	0.56
9	9 33 8.06	0.102	15 18 50.5	0.60	9 6 21.6	9 33 8.72	0.104	15 18 46.8	0.60
10	9 33 10.63	0.111	15 18 35.7	0.64	10 6 17.7	9 33 11.33	0.113	15 18 31.7	0.65
11	9 33 13.40	0.120	15 18 19.9	0.68	11 6 13.8	9 33 14.15	0.122	15 18 15.7	0.69
12	9 33 16.38	0.129	15 18 3.0	0.72	12 6 9.9	9 33 17.18	0.130	15 17 58.6	0.73
13	9 33 19.56	0.137	15 17 45.2	0.76	13 6 6.1	9 33 20.41	0.139	15 17 40.6	0.77
14	9 33 22.96	0.146	15 17 26.3	0.81	14 6 2.2	9 33 23.84	0.147	15 17 21.5	0.81
15	9 33 26.56	0.155	15 17 6.4	0.85	15 5 58.3	9 33 27.48	0.156	15 17 1.4	0.85
16	9 33 30.37	0.163	15 16 45.5	0.89	16 5 54.5	9 33 31.33	0.165	15 16 40.3	0.90
17	9 33 34.38	0.172	15 16 23.6	0.93	17 5 50.6	9 33 35.38	0.173	15 16 18.2	0.94
18	9 33 38.60	0.180	15 16 0.7	0.97	18 5 46.7	9 33 39.64	0.181	15 15 55.1	0.98
19	9 33 43.02	0.188	15 15 36.8	1.02	19 5 42.9	9 33 44.10	0.189	15 15 31.0	1.02
20	9 33 47.64	0.196	15 15 11.9	1.06	20 5 39.1	9 33 48.75	0.197	15 15 5.9	1.06
21	9 33 52.46	0.204	15 14 46.1	1.10	21 5 35.2	9 33 53.60	0.206	15 14 39.9	1.10
22	9 33 57.47	0.213	15 14 19.3	1.14	22 5 31.4	9 33 58.64	0.214	15 14 12.9	1.14
23	9 34 2.69	0.221	15 13 51.6	1.18	23 5 27.5	9 34 3.89	0.223	15 13 45.1	1.18
24	9 34 8.10	0.229	15 13 22.9	1.21	24 5 23.7	9 34 9.33	0.230	15 13 16.3	1.22
25	9 34 13.70	0.237	15 12 53.3	1.25	25 5 19.9	9 34 14.96	0.239	15 12 46.5	1.26
26	9 34 19.50	0.245	15 12 22.7	1.29	26 5 16.0	9 34 20.79	0.246	15 12 15.9	1.30
27	9 34 25.48	0.253	15 11 51.2	1.33	27 5 12.2	9 34 26.80	0.254	15 11 44.3	1.34
28	9 34 31.66	0.261	15 11 18.8	1.37	28 5 8.3	9 34 33.00	0.263	15 11 11.8	1.38
29	9 34 38.03	0.269	15 10 45.5	1.41	29 5 4.5	9 34 39.40	0.270	15 10 38.4	1.41
30	9 34 44.58	0.277	15 10 11.2	1.45	30 5 0.7	9 34 45.97	0.278	15 10 4.0	1.45
31	9 34 51.32	0.285	15 9 36.1	1.48	31 4 56.8	9 34 52.73	0.286	15 9 28.8	1.49
June 1	9 34 58.24	0.293	15 9 0.0	1.52	1 4 53.0	9 34 59.67	0.293	15 8 52.6	1.53
2	9 35 5.35	0.301	15 8 23.1	1.56	2 4 49.2	9 35 6.80	0.301	15 8 15.5	1.56
3	9 35 12.64	0.308	15 7 45.2	1.60	3 4 45.4	9 35 14.11	0.309	15 7 37.6	1.60
4	9 35 20.11	0.314	15 7 6.5	1.63	4 4 41.6	9 35 21.60	0.315	15 6 58.9	1.63
5	9 35 27.76	0.322	15 6 26.9	1.67	5 4 37.8	9 35 29.26	0.322	15 6 19.2	1.67
6	9 35 35.58	0.329	15 5 46.4	1.70	6 4 34.0	9 35 37.09	0.329	15 5 38.7	1.71
7	9 35 43.58	0.337	15 5 5.1	1.74	7 4 30.2	9 35 45.10	0.337	15 4 57.3	1.74
8	9 35 51.75	0.344	15 4 22.9	1.77	8 4 26.4	9 35 53.28	0.344	15 4 15.1	1.77
9	9 36 0.09	0.351	15 3 39.9	1.81	9 4 22.6	9 36 1.63	0.351	15 3 32.1	1.81
10	9 36 8.60	0.358	15 2 56.0	1.84	10 4 18.8	9 36 10.15	0.358	15 2 48.3	1.85
11	9 36 17.28	0.365	15 2 11.3	1.88	11 4 15.0	9 36 18.84	0.366	15 2 3.4	1.88
12	9 36 26.12	0.372	15 1 25.7	1.91	12 4 11.2	9 36 27.68	0.372	15 1 17.8	1.92
13	9 36 35.13	0.379	15 0 39.3	1.95	13 4 7.4	9 36 36.69	0.379	15 0 31.4	1.95
14	9 36 44.30	0.385	14 59 52.2	1.98	14 4 3.7	9 36 45.87	0.386	14 59 44.2	1.98
15	9 36 53.63	0.392	14 59 4.2	2.01	15 3 59.9	9 36 55.20	0.392	14 58 56.2	2.02
16	9 37 3.12	0.399	14 58 15.4	2.05	16 3 56.1	9 37 4.69	0.399	14 58 7.4	2.05
17	9 37 12.76	0.405	14 57 25.9	2.08	17 3 52.4	9 37 14.33	0.405	14 57 17.9	2.08
18	9 37 22.56	0.412	14 56 35.7	2.11	18 3 48.6	9 37 24.13	0.411	14 56 27.7	2.11
19	9 37 32.51	0.418	14 55 44.7	2.14	19 3 44.8	9 37 34.07	0.418	14 55 36.7	2.14
20	9 37 42.60	0.424	14 54 53.0	2.17	20 3 41.0	9 37 44.16	0.424	14 54 45.0	2.17
21	9 37 52.84	0.430	14 54 0.5	2.20	21 3 37.3	9 37 54.40	0.430	14 53 52.6	2.20
22	9 38 3.23	0.436	14 53 7.3	2.23	22 3 33.5	9 38 4.78	0.436	14 52 59.4	2.23
23	9 38 13.76	0.441	14 52 13.4	2.26	23 3 29.7	9 38 15.30	0.441	14 52 5.5	2.26
24	9 38 24 42	0.447	14 51 18.8	2.29	24 3 26.0	9 38 25.95	0.446	14 51 10.9	2.29
25	9 38 35.22	0.452	14 50 23.5	2.32	25 3 22.3	9 38 36.74	0.452	14 50 15.7	2.31
26	9 38 46.15	0.458	14 49 27.6	2.35	26 3 18.5	9 38 47.66	0.457	14 49 19.8	2.34
27	9 38 57.21	0.463	14 48 30.9	2.38	27 3 14.8	9 38 58.71	0.463	14 48 23.2	2.37
28	9 39 8.41	0.469	14 47 33.6	2.40	28 3 11.0	9 39 9.90	0.468	14 47 25.9	2.40
29	9 39 19.73	0.474	14 46 35.7	2.43	29 3 7.3	9 39 21.21	0.474	14 46 28.0	2.42
30	9 39 31.18	0.479	14 45 37.1	2.45	30 3 3.6	9 39 32.65	0.479	14 45 29.5	2.45
31	9 39 42.75	+0.485	+14 44 37.9	−2.48	31 2 59.8	9 39 44.21	+0.484	+14 44 30.4	−2.48

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	9 39 42.75	+0.485	+14 44 37.9	−2.48	1 2 59.8	9 39 44.21	+0.484	+14 44 30.4	−2.48
2	9 39 54.44	0.490	14 43 38.0	2.51	2 2 56.1	9 39 55.88	0.489	14 43 30.6	2.50
3	9 40 6.26	0.495	14 42 37.5	2.53	3 2 52.4	9 40 7.69	0.494	14 42 30.2	2.53
4	9 40 18.19	0.499	14 41 36.5	2.56	4 2 48.7	9 40 19.60	0.498	14 41 29.3	2.55
5	9 40 30.23	0.504	14 40 34.8	2.58	5 2 44.9	9 40 31.62	0.503	14 40 27.8	2.58
6	9 40 42.39	0.509	14 39 32.6	2.60	6 2 41.2	9 40 43.76	0.508	14 39 25.6	2.60
7	9 40 54.66	0.514	14 38 29.8	2.63	7 2 37.5	9 40 56.01	0.513	14 38 22.9	2.62
8	9 41 7.04	0.518	14 37 26.4	2.65	8 2 33.8	9 41 8.37	0.517	14 37 19.6	2.65
9	9 41 19.53	0.522	14 36 22.5	2.67	9 2 30.0	9 41 20.84	0.522	14 36 15.8	2.67
10	9 41 32.12	0.527	14 35 18.0	2.69	10 2 26.3	9 41 33.41	0.526	14 35 11.4	2.69
11	9 41 44.81	0.531	14 34 13.0	2.72	11 2 22.6	9 41 46.08	0.530	14 34 6.5	2.72
12	9 41 57.60	0.535	14 33 7.5	2.74	12 2 18.8	9 41 58.84	0.534	14 33 1.2	2.74
13	9 42 10.48	0.539	14 32 1.5	2.76	13 2 15.1	9 42 11.70	0.538	14 31 55.3	2.76
14	9 42 23.45	0.543	14 30 55.0	2.78	14 2 11.4	9 42 24.65	0.542	14 30 48.9	2.78
15	9 42 36.51	0.546	14 29 48.1	2.80	15 2 7.7	9 42 37.68	0.545	14 29 42.1	2.79
16	9 42 49.66	0.550	14 28 40.7	2.82	16 2 4.0	9 42 50.80	0.549	14 28 34.9	2.81
17	9 43 2.90	0.554	14 27 32.8	2.84	17 2 0.2	9 43 4.01	0.552	14 27 27.2	2.83
18	9 43 16.22	0.557	14 26 24.5	2.85	18 1 56.5	9 43 17.30	0.556	14 26 19.0	2.85
19	9 43 29.61	0.560	14 25 15.8	2.87	19 1 52.8	9 43 30.66	0.559	14 25 10.4	2.86
20	9 43 43.07	0.562	14 24 6.7	2.89	20 1 49.1	9 43 44.09	0.561	14 24 1.5	2.88
21	9 43 56.61	0.565	14 22 57.2	2.90	21 1 45.4	9 43 57.60	0.564	14 22 52.2	2.90
22	9 44 10.23	0.568	14 21 47.3	2.92	22 1 41.7	9 44 11.19	0.567	14 21 42.4	2.92
23	9 44 23.91	0.571	14 20 37.0	2.94	23 1 38.0	9 44 24.84	0.570	14 20 32.3	2.93
24	9 44 37.66	0.574	14 19 26.4	2.95	24 1 34.3	9 44 38.56	0.572	14 19 21.8	2.94
25	9 44 51.46	0.576	14 18 15.4	2.96	25 1 30.6	9 44 52.33	0.575	14 18 11.0	2.96
26	9 45 5.33	0.579	14 17 4.1	2.98	26 1 26.9	9 45 6.17	0.577	14 16 59.8	2.97
27	9 45 19.26	0.581	14 15 52.4	2.99	27 1 23.2	9 45 20.07	0.580	14 15 48.3	2.98
28	9 45 33.25	0.583	14 14 40.5	3.00	28 1 19.5	9 45 34.02	0.582	14 14 36.5	3.00
29	9 45 47.28	0.585	14 13 28.2	3.01	29 1 15.8	9 45 48.02	0.584	14 13 24.4	3.01
30	9 46 1.37	0.587	14 12 15.7	3.03	30 1 12.1	9 46 2.07	0.586	14 12 12.1	3.02
31	9 46 15.50	0.589	14 11 3.0	3.04	31 1 8.4	9 46 16.17	0.588	14 10 59.5	3.03
Aug. 1	9 46 29.68	0.591	14 9 49.9	3.05	1 1 4.7	9 46 30.32	0.590	14 9 46.6	3.04
2	9 46 43.91	0.593	14 8 36.6	3.06	2 1 1.0	9 46 44.51	0.592	14 8 33.5	3.05
3	9 46 58.18	0.595	14 7 23.1	3.07	3 0 57.3	9 46 58.75	0.594	14 7 20.1	3.06
4	9 47 12.49	0.597	14 6 9.3	3.08	4 0 53.6	9 47 13.02	0.595	14 6 6.5	3.07
5	9 47 26.83	0.598	14 4 55.4	3.09	5 0 49.9	9 47 27.33	0.597	14 4 52.8	3.08
6	9 47 41.21	0.599	14 3 41.2	3.10	6 0 46.3	9 47 41.67	0.598	14 3 38.8	3.09
7	9 47 55.62	0.600	14 2 26.8	3.10	7 0 42.6	9 47 56.04	0.599	14 2 24.6	3.09
8	9 48 10.05	0.601	14 1 12.3	3.11	8 0 38.9	9 48 10.44	0.600	14 1 10.3	3.10
9	9 48 24.50	0.602	13 59 57.6	3.11	9 0 35.2	9 48 24.86	0.601	13 59 55.8	3.10
10	9 48 38.98	0.603	13 58 42.8	3.12	10 0 31.5	9 48 39.30	0.602	13 58 41.2	3.11
11	9 48 53.48	0.604	13 57 27.8	3.13	11 0 27.7	9 48 53.76	0.603	13 57 26.4	3.12
12	9 49 7.99	0.605	13 56 12.7	3.13	12 0 24.0	9 49 8.24	0.603	13 56 11.5	3.12
13	9 49 22.52	0.605	13 54 57.6	3.13	13 0 20.4	9 49 22.73	0.604	13 54 56.6	3.12
14	9 49 37.05	0.606	13 53 42.4	3.14	14 0 16.7	9 49 37.22	0.604	13 53 41.6	3.13
15	9 49 51.58	0.606	13 52 27.1	3.14	15 0 13.0	9 49 51.71	0.604	13 52 26.5	3.13
16	9 50 6.13	0.606	13 51 11.7	3.14	16 0 9.3	9 50 6.22	0.604	13 51 11.2	3.13
17	9 50 20.68	0.606	13 49 56.3	3.14	17 0 5.6	9 50 20.73	0.604	13 49 56.0	3.13
18	9 50 35.22	0.606	13 48 40.9	3.14	18 0 1.9	9 50 35.24	0.604	13 48 40.8	3.13
					18 23 58.2	9 50 49.74	0.604	13 47 25.7	3.13
19	9 50 49.76	0.606	13 47 25.6	3.14	19 23 54.6	9 51 4.23	0.604	13 46 10.5	3.13
20	9 51 4.29	0.605	13 46 10.2	3.14	20 23 50.9	9 51 18.73	0.604	13 44 55.3	3.13
21	9 51 18.82	0.605	13 44 54.8	3.14	21 23 47.2	9 51 33.21	0.603	13 43 40.2	3.13
22	9 51 33.34	0.604	13 43 39.5	3.14	22 23 43.5	9 51 47.67	0.602	13 42 25.1	3.13
23	9 51 47.84	0.604	13 42 24.2	3.14	23 23 39.8	9 52 2.11	0.601	13 41 10.1	3.12
24	9 52 2.32	0.603	13 41 9.0	3.13	24 23 36.2	9 52 16.54	0.600	13 39 55.2	3.12
25	9 52 16.78	0.602	13 39 53.9	3.13	25 23 32.5	9 52 30.95	0.599	13 38 40.2	3.12
26	9 52 31.23	0.601	13 38 38.8	3.12	26 23 28.8	9 52 45.33	0.598	13 37 25.4	3.11
27	9 52 45.65	0.600	13 37 23.8	3.12	27 23 25.1	9 52 59.69	0.597	13 36 10.8	3.11
28	9 53 0.04	0.599	13 36 9.0	3.11	28 23 21.4	9 53 14.01	0.596	13 34 56.3	3.10
29	9 53 14.40	0.598	13 34 54.3	3.11	29 23 17.7	9 53 28.30	0.594	13 33 41.9	3.10
30	9 53 28.73	0.597	13 33 39.7	3.10	30 23 14.0	9 53 42.56	0.593	13 32 27.6	3.09
31	9 53 43.02	+0.595	+13 32 25.2	−3.10	31 23 10.3	9 53 56.78	+0.591	+13 31 13.5	−3.08

URANUS, 1877.

Date. 1877.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Sept. 1	9 53 57.28	+0.593	+13 31 10.9	−3.09	1 23 6.6	9 54 10.96	+0.590	+13 29 59.6	−3.07
2	9 54 11.50	0.591	13 29 56.9	3.08	2 23 2.9	9 54 25.10	0.588	13 28 46.0	3.06
3	9 54 25.67	0.589	13 28 43.0	3.07	3 22 59.2	9 54 39.20	0.586	13 27 32.5	3.06
4	9 54 39.80	0.587	13 27 29.3	3.06	4 22 55.5	9 54 53.25	0.584	13 26 19.2	3.05
5	9 54 53.88	0.585	13 26 15.9	3.05	5 22 51.8	9 55 7.24	0.582	13 25 6.2	3.04
6	9 55 7.91	0.583	13 25 2.7	3.04	6 22 48.1	9 55 21.17	0.580	13 23 53.5	3.03
7	9 55 21.87	0.581	13 23 49.8	3.03	7 22 44.4	9 55 35.05	0.577	13 22 41.0	3.01
8	9 55 35.78	0.578	13 22 37.2	3.02	8 22 40.7	9 55 48.87	0.574	13 21 28.8	3.00
9	9 55 49.63	0.575	13 21 24.9	3.01	9 22 37.0	9 56 2.63	0.571	13 20 17.0	2.98
10	9 56 3.42	0.573	13 20 12.9	2.99	10 22 33.2	9 56 16.31	0.568	13 19 5.5	2.97
11	9 56 17.14	0.570	13 19 1.3	2.98	11 22 29.5	9 56 29.93	0.565	13 17 54.4	2.95
12	9 56 30.79	0.567	13 17 50.0	2.96	12 22 25.8	9 56 43.48	0.563	13 16 43.7	2.94
13	9 56 44.37	0.564	13 16 39.1	2.94	13 22 22.1	9 56 56.96	0.560	13 15 33.4	2.92
14	9 56 57.88	0.561	13 15 28.6	2.93	14 22 18.4	9 57 10.36	0.557	13 14 23.4	2.91
15	9 57 11.31	0.558	13 14 18.4	2.92	15 22 14.7	9 57 23.60	0.554	13 13 13.7	2.89
16	9 57 24.66	0.555	13 13 8.6	2.90	16 22 11.0	9 57 36.93	0.550	13 12 4.5	2.87
17	9 57 37.93	0.551	13 11 59.3	2.88	17 22 7.3	9 57 50.08	0.546	13 10 55.8	2.85
18	9 57 51.11	0.547	13 10 50.4	2.86	18 22 3.5	9 58 3.14	0.543	13 9 47.5	2.84
19	9 58 4.20	0.544	13 9 42.0	2.84	19 21 59.8	9 58 16.12	0.540	13 8 39.6	2.82
20	9 58 17.21	0.540	13 8 34.0	2.82	20 21 56.1	9 58 29.01	0.536	13 7 32.3	2.80
21	9 58 30.12	0.536	13 7 26.5	2.80	21 21 52.4	9 58 41.81	0.531	13 6 25.4	2.78
22	9 58 42.94	0.532	13 6 19.5	2.78	22 21 48.7	9 58 54.50	0.527	13 5 19.0	2.75
23	9 58 55.66	0.528	13 5 13.0	2.76	23 21 44.9	9 59 7.10	0.523	13 4 13.2	2.73
24	9 59 8.28	0.524	13 4 7.0	2.74	24 21 41.2	9 59 19.60	0.519	13 3 7.9	2.71
25	9 59 20.80	0.519	13 3 1.6	2.72	25 21 37.5	9 59 31.99	0.514	13 2 3.1	2.69
26	9 59 33.21	0.515	13 1 56.7	2.69	26 21 33.8	9 59 44.28	0.510	13 0 58.8	2.67
27	9 59 45.52	0.510	13 0 52.3	2.67	27 21 30.1	9 59 56.45	0.505	12 59 55.2	2.64
28	9 59 57.71	0.506	12 59 48.6	2.64	28 21 26.3	10 0 8.50	0.500	12 58 52.1	2.62
29	10 0 9.78	0.501	12 58 45.4	2.62	29 21 22.6	10 0 20.45	0.495	12 57 49.6	2.59
30	10 0 21.75	0.496	12 57 42.8	2.59	30 21 18.9	10 0 32.28	0.490	12 56 47.8	2.56
Oct. 1	10 0 33.60	0.491	12 56 40.9	2.57	1 21 15.2	10 0 43.99	0.485	12 55 46.6	2.53
2	10 0 45.33	0.486	12 55 39.6	2.54	2 21 11.4	10 0 55.59	0.480	12 54 46.1	2.51
3	10 0 56.94	0.481	12 54 39.0	2.51	3 21 7.7	10 1 7.06	0.475	12 53 46.3	2.48
4	10 1 8.42	0.475	12 53 39.1	2.48	4 21 4.0	10 1 18.40	0.470	12 52 47.0	2.45
5	10 1 19.78	0.470	12 52 39.8	2.46	5 21 0.2	10 1 29.61	0.464	12 51 48.5	2.42
6	10 1 31.00	0.464	12 51 41.2	2.43	6 20 56.4	10 1 40.69	0.458	12 50 50.6	2.40
7	10 1 42.09	0.459	12 50 43.3	2.40	7 20 52.7	10 1 51.63	0.452	12 49 53.5	2.37
8	10 1 53.04	0.453	12 49 46.1	2.37	8 20 49.0	10 2 2.43	0.447	12 48 57.1	2.33
9	10 2 3.85	0.447	12 48 49.7	2.34	9 20 45.2	10 2 13.09	0.441	12 48 1.5	2.30
10	10 2 14.52	0.441	12 47 54.0	2.30	10 20 41.4	10 2 23.61	0.435	12 47 6.6	2.27
11	10 2 25.05	0.436	12 46 59.1	2.27	11 20 37.7	10 2 33.98	0.430	12 46 12.6	2.23
12	10 2 35.43	0.430	12 46 5.1	2.24	12 20 33.9	10 2 44.21	0.423	12 45 19.4	2.20
13	10 2 45.66	0.423	12 45 11.8	2.20	13 20 30.1	10 2 54.29	0.417	12 44 27.0	2.17
14	10 2 55.75	0.417	12 44 19.4	2.17	14 20 26.4	10 3 4.22	0.411	12 43 35.4	2.13
15	10 3 5.68	0.411	12 43 27.8	2.13	15 20 22.6	10 3 14.00	0.404	12 42 44.6	2.10
16	10 3 15.46	0.404	12 42 37.0	2.10	16 20 18.8	10 3 23.61	0.397	12 41 54.7	2.06
17	10 3 25.07	0.397	12 41 47.1	2.06	17 20 15.1	10 3 33.07	0.391	12 41 5.6	2.03
18	10 3 34.53	0.391	12 40 58.1	2.02	18 20 11.3	10 3 42.36	0.384	12 40 17.4	1.99
19	10 3 43.82	0.384	12 40 9.9	1.99	19 20 7.5	10 3 51.50	0.377	12 39 30.1	1.95
20	10 3 52.96	0.377	12 39 22.6	1.95	20 20 3.7	10 4 0.48	0.370	12 38 43.7	1.92
21	10 4 1.94	0.368	12 38 36.2	1.92	21 19 59.9	10 4 9.29	0.364	12 37 58.1	1.88
22	10 4 10.74	0.363	12 37 50.7	1.88	22 19 56.1	10 4 17.94	0.357	12 37 13.5	1.84
23	10 4 19.38	0.355	12 37 6.1	1.84	23 19 52.3	10 4 26.41	0.349	12 36 29.8	1.80
24	10 4 27.84	0.349	12 36 22.4	1.80	24 19 48.5	10 4 34.71	0.342	12 35 47.1	1.76
25	10 4 36.14	0.342	12 35 39.7	1.76	25 19 44.7	10 4 42.84	0.335	12 35 5.3	1.72
26	10 4 44.26	0.334	12 34 57.9	1.72	26 19 40.9	10 4 50.79	0.327	12 34 24.5	1.68
27	10 4 52.20	0.327	12 34 17.2	1.68	27 19 37.1	10 4 58.56	0.320	12 33 44.6	1.64
28	10 4 59.96	0.319	12 33 37.4	1.64	28 19 33.3	10 5 6.15	0.312	12 33 5.6	1.60
29	10 5 7.54	0.312	12 32 58.6	1.60	29 19 29.6	10 5 13.57	0.306	12 32 27.7	1.56
30	10 5 14.94	0.305	12 32 20.7	1.55	30 19 25.7	10 5 20.80	0.297	12 31 50.8	1.52
31	10 5 22.16	+0.297	+12 31 43.9	−1.51	31 19 21.9	10 5 27.84	+0.290	+12 31 14.9	−1.47

URANUS, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Nov. 1	10 5 29.18	+0.289	+12 31 8.1	−1.47	1 19 18.1	10 5 34.70	+0.282	+12 30 40.1	−1.43
2	10 5 36.02	0.281	12 30 33.4	1.42	2 19 14.3	10 5 41.36	0.274	12 30 6.3	1.38
3	10 5 42.66	0.273	12 29 59.7	1.38	3 19 10.5	10 5 47.84	0.266	12 29 33.6	1.34
4	10 5 49.12	0.265	12 29 27.1	1.34	4 19 6.6	10 5 54.12	0.258	12 29 1.9	1.30
5	10 5 55.38	0.257	12 28 55.5	1.29	5 19 2.8	10 6 0.21	0.250	12 28 31.3	1.25
6	10 6 1.45	0.248	12 28 25.1	1.25	6 18 59.0	10 6 6.10	0.241	12 28 1.8	1.21
7	10 6 7.31	0.240	12 27 55 7	1.20	7 18 55.2	10 6 11.80	0.233	12 27 33.3	1.17
8	10 6 12.98	0.232	12 27 27.4	1.16	8 18 51.3	10 6 17.30	0.225	12 27 5.9	1.12
9	10 6 18.45	0.223	12 27 0.2	1.11	9 18 47.4	10 6 22.60	0.216	12 26 39.7	1.07
10	10 6 23.72	0.215	12 26 34.1	1.06	10 18 43.6	10 6 27.69	0.208	12 26 14.6	1.02
11	10 6 28.78	0 207	12 26 9.2	1.02	11 18 39.7	10 6 32.58	0.199	12 25 50.6	0.98
12	10 6 33.64	0.198	12 25 45.4	0.97	12 18 35.9	10 6 37.26	0.190	12 25 27.7	0.93
13	10 6 38.29	0.189	12 25 22.7	0.92	13 18 32.0	10 6 41.74	0.183	12 25 5.9	0.88
14	10 6 42.74	0.182	12 25 1.1	0.88	14 18 28.2	10 6 46.02	0.174	12 24 45.2	0.84
15	10 6 46.98	0.173	12 24 40.6	0.83	15 18 24.3	10 6 50.10	0.165	12 24 25.7	0.79
16	10 6 51.02	0.164	12 24 21.3	0.78	16 18 20.4	10 6 53.96	0.157	12 24 7.3	0.74
17	10 6 54.84	0.155	12 24 3.1	0.73	17 18 16.5	10 6 57.62	0.148	12 23 50.0	0.69
18	10 6 58.46	0.147	12 23 46.1	0.69	18 18 12.7	10 7 1.07	0.139	12 23 33.9	0.65
19	10 7 1.87	0.138	12 23 30.2	0.64	19 18 8.8	10 7 4.31	0.131	12 23 19.0	0.60
20	10 7 5.07	0.129	12 23 15.5	0.59	20 18 4.9	10 7 7.34	0.122	12 23 5.2	0.55
21	10 7 8.06	0.120	12 23 2.0	0.54	21 18 1.0	10 7 10.16	0.113	12 22 52.6	0.50
22	10 7 10.83	0.111	12 22 49.6	0.49	22 17 57.1	10 7 12.77	0.104	12 22 41.1	0.45
23	10 7 13.39	0.102	12 22 38.4	0.44	23 17 53.2	10 7 15.17	0.095	12 22 30.8	0.40
24	10 7 15.74	0.093	12 22 28.4	0.39	24 17 49.3	10 7 17.35	0.086	12 22 21.8	0.35
25	10 7 17.87	0.084	12 22 19.6	0.34	25 17 45.4	10 7 19.31	0.077	12 22 13.8	0.30
26	10 7 19.78	0.075	12 22 11.9	0.29	26 17 41.5	10 7 21.06	0.069	12 22 7.1	0.26
27	10 7 21.48	0.066	12 22 5.5	0.24	27 17 37.7	10 7 22.60	0.060	12 22 1.5	0.21
28	10 7 22.97	0.058	12 22 0.2	0.19	28 17 33.8	10 7 23.92	0.051	12 21 57.1	0.16
29	10 7 24.24	0.049	12 21 56.1	0.15	29 17 29.9	10 7 25.03	0.042	12 21 53.9	0.11
30	10 7 25.29	0.039	12 21 53.2	0.10	30 17 25.9	10 7 25.92	0.033	12 21 51.7	0.06
Dec. 1	10 7 26.12	0.030	12 21 51.5	−0.05	1 17 22.0	10 7 26.60	0.024	12 21 50.9	−0.01
2	10 7 26.73	0.021	12 21 50.9	0.00	2 17 18.1	10 7 27.06	0.015	12 21 51.2	+0.04
3	10 7 27.14	0.012	12 21 51.6	+0.05	3 17 14.2	10 7 27.30	+0.006	12 21 52.7	0.09
4	10 7 27.32	+0.003	12 21 53.4	0.10	4 17 10.2	10 7 27.33	−0.003	12 21 55.4	0.14
5	10 7 27.28	−0.006	12 21 56.5	0.15	5 17 6.3	10 7 27.14	0.013	12 21 59.3	0.19
6	10 7 27.03	0.015	12 22 0.7	0.20	6 17 2.4	10 7 26.74	0.022	12 22 4.3	0.23
7	10 7 26.56	0.024	12 22 6.1	0.25	7 16 58.4	10 7 26.12	0.031	12 22 10.6	0.28
8	10 7 25.88	0.033	12 22 12.7	0.30	8 16 54.5	10 7 25.28	0.040	12 22 18.0	0.33
9	10 7 24.98	0.042	12 22 20.5	0.35	9 16 50.5	10 7 24.22	0.049	12 22 26.7	0.38
10	10 7 23.86	0.051	12 22 29.5	0.40	10 16 46.5	10 7 22.96	0.057	12 22 36.4	0.43
11	10 7 22.53	0.060	12 22 39.6	0.45	11 16 42.6	10 7 21.49	0.065	12 22 47.2	0.47
12	10 7 20.99	0.068	12 22 50.8	0.49	12 16 38.6	10 7 19.81	0.074	12 22 59.2	0.52
13	10 7 19.24	0.077	12 23 3.2	0.54	13 16 34.7	10 7 17.91	0.083	12 23 12.4	0.57
14	10 7 17.27	0.086	12 23 16.8	0.59	14 16 30.7	10 7 15.80	0.092	12 23 26.7	0.62
15	10 7 15.09	0.095	12 23 31.5	0.63	15 16 26.7	10 7 13.48	0.100	12 23 42.1	0.67
16	10 7 12.70	0.104	12 23 47.4	0.68	16 16 22.7	10 7 10.96	0.109	12 23 58.7	0.71
17	10 7 10.11	0.112	12 24 4.3	0.73	17 16 18.8	10 7 8.23	0.118	12 24 16.3	0.76
18	10 7 7.31	0.121	12 24 22.3	0.77	18 16 14.8	10 7 5.30	0.126	12 24 35.1	0.80
19	10 7 4.31	0.129	12 24 41.5	0.82	19 16 10.8	10 7 2.17	0.135	12 24 54.9	0.85
20	10 7 1.10	0.138	12 25 1.7	0.86	20 16 6.8	10 6 58.84	0.143	12 25 15.8	0.90
21	10 6 57.69	0.146	12 25 23.0	0.91	21 16 2.8	10 6 55.31	0.151	12 25 37.8	0.94
22	10 6 54.09	0.155	12 25 45.4	0.95	22 15 58.8	10 6 51.58	0.160	12 26 0.9	0.98
23	10 6 50.28	0.163	12 26 8.9	1.00	23 15 54.8	10 6 47.65	0.168	12 26 25.0	1.03
24	10 6 46.27	0.171	12 26 33.4	1.04	24 15 50.8	10 6 43.53	0.176	12 26 50.2	1.07
25	10 6 42.07	0.180	12 26 59.0	1.09	25 15 46.8	10 6 39.21	0.184	12 27 16.4	1.11
26	10 6 37.67	0.187	12 27 25.6	1.13	26 15 42.8	10 6 34.70	0.191	12 27 43.7	1.16
27	10 6 33.08	0.195	12 27 53.3	1.17	27 15 38.9	10 6 30.00	0.199	12 28 11.9	1.20
28	10 6 28.30	0.203	12 28 21.9	1.21	28 15 34.9	10 6 25.10	0.207	12 28 41.1	1.24
29	10 6 23.33	0.211	12 28 51.6	1.26	29 15 30.8	10 6 20.02	0.215	12 29 11.4	1.28
30	10 6 18.17	0.219	12 29 22.3	1.30	30 15 26.8	10 6 14.75	0.223	12 29 42.6	1.32
31	10 6 12.82	−0.226	+12 29 53.9	+1.34	31 15 22.8	10 6 9.31	−0.231	+12 30 14.7	+1.36

NEPTUNE, 1877.

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Jan. 0	2 3 53.57	−0.067	+10 40 45.1	−0.21	0 7 20.8	2 3 53.09	−0.066	+10 40 43.6	−0.20
1	2 3 52.02	0.062	10 40 40.5	0.18	1 7 16.9	2 3 51.58	0.060	10 40 39.2	0.17
2	2 3 50.60	0.056	10 40 36.6	0.15	2 7 12.9	2 3 50.20	0.055	10 40 35.5	0.14
3	2 3 49.31	0.051	10 40 33.4	0.12	3 7 8.9	2 3 48.95	0.050	10 40 32.5	0.11
4	2 3 48.14	0.046	10 40 30.9	0.09	4 7 5.0	2 3 47.82	0.044	10 40 30.2	0.08
5	2 3 47.09	0.041	10 40 29.0	0.06	5 7 1.0	2 3 46.82	0.039	10 40 28.6	0.05
6	2 3 46.18	0.035	10 40 27.9	−0.03	6 6 57.1	2 3 45.95	0.034	10 40 27.7	−0.02
7	2 3 45.41	0.029	10 40 27.5	0.00	7 6 53.2	2 3 45.21	0.028	10 40 27.5	+0.01
8	2 3 44.77	0.024	10 40 27.9	+0.03	8 6 49.2	2 3 44.61	0.022	10 40 28.1	0.04
9	2 3 44.26	0.019	10 40 29.1	0.06	9 6 45.3	2 3 44.14	0.017	10 40 29.4	0.07
10	2 3 43.88	0.013	10 40 30.9	0.09	10 6 41.4	2 3 43.80	0.011	10 40 31.5	0.10
11	2 3 43.63	0.007	10 40 33.5	0.12	11 6 37.4	2 3 43.59	−0.006	10 40 34.3	0.13
12	2 3 43.52	−0.001	10 40 36.8	0.15	12 6 33.5	2 3 43.52	0.000	10 40 37.8	0.16
13	2 3 43.55	+0.004	10 40 40.9	0.18	13 6 29.6	2 3 43.58	+0.005	10 40 42.0	0.19
14	2 3 43.71	0.009	10 40 45.6	0.21	14 6 25.6	2 3 43.77	0.011	10 40 47.0	0.22
15	2 3 44.00	0.015	10 40 51.0	0.24	15 6 21.7	2 3 44.10	0.016	10 40 52.6	0.25
16	2 3 44.43	0.021	10 40 57.2	0.27	16 6 17.8	2 3 44.56	0.022	10 40 58.9	0.28
17	2 3 44.99	0.026	10 41 4.1	0.30	17 6 13.8	2 3 45.16	0.028	10 41 6.0	0.31
18	2 3 45.69	0.032	10 41 11.8	0.33	18 6 9.9	2 3 45.89	0.033	10 41 13.8	0.34
19	2 3 46.52	0.037	10 41 20.1	0.36	19 6 6.0	2 3 46.75	0.039	10 41 22.3	0.37
20	2 3 47.48	0.043	10 41 29.1	0.39	20 6 2.1	2 3 47.75	0.044	10 41 31.5	0.40
21	2 3 48.58	0.049	10 41 38.9	0.42	21 5 58.2	2 3 48.88	0.050	10 41 41.4	0.43
22	2 3 49.82	0.054	10 41 49.4	0.45	22 5 54.3	2 3 50.15	0.056	10 41 52.0	0.46
23	2 3 51.19	0.060	10 42 0.5	0.48	23 5 50.4	2 3 51.55	0.061	10 42 3.3	0.49
24	2 3 52.68	0.065	10 42 12.4	0.51	24 5 46.5	2 3 53.07	0.066	10 42 15.3	0.52
25	2 3 54.30	0.070	10 42 25.0	0.54	25 5 42.6	2 3 54.71	0.071	10 42 28.1	0.55
26	2 3 56.06	0.076	10 42 38.3	0.57	26 5 38.6	2 3 56.49	0.077	10 42 41.5	0.57
27	2 3 57.95	0.082	10 42 52.2	0.60	27 5 34.7	2 3 58.41	0.083	10 42 55.6	0.60
28	2 3 59.98	0.087	10 43 6.9	0.63	28 5 30.8	2 4 0.46	0.088	10 43 10.4	0.63
29	2 4 2.13	0.092	10 43 22.2	0.66	29 5 26.9	2 4 2.64	0.093	10 43 25.8	0.66
30	2 4 4.41	0.098	10 43 38.3	0.68	30 5 23.0	2 4 4.94	0.099	10 43 42.0	0.69
31	2 4 6.82	0.103	10 43 55.1	0.71	31 5 19.2	2 4 7.37	0.104	10 43 58.9	0.72
Feb. 1	2 4 9.37	0.109	10 44 12.5	0.74	1 5 15.3	2 4 9.94	0.110	10 44 16.4	0.74
2	2 4 12.04	0.114	10 44 30.5	0.76	2 5 11.4	2 4 12.63	0.115	10 44 34.5	0.77
3	2 4 14.84	0.119	10 44 49.2	0.79	3 5 7.5	2 4 15.45	0.120	10 44 53.2	0.80
4	2 4 17.76	0.124	10 45 8.6	0.82	4 5 3.6	2 4 18.39	0.125	10 45 12.7	0.82
5	2 4 20.81	0.130	10 45 28.6	0.85	5 4 59.7	2 4 21.46	0.130	10 45 32.8	0.85
6	2 4 23.99	0.135	10 45 49.3	0.88	6 4 55.9	2 4 24.65	0.136	10 45 53.6	0.88
7	2 4 27.29	0.140	10 46 10.7	0.90	7 4 52.0	2 4 27.97	0.141	10 46 15.1	0.91
8	2 4 30.72	0.145	10 46 32.6	0.93	8 4 48.1	2 4 31.42	0.146	10 46 37.2	0.93
9	2 4 34.27	0.151	10 46 55.2	0.95	9 4 44.2	2 4 34.99	0.151	10 46 59.8	0.96
10	2 4 37.95	0.156	10 47 18.5	0.98	10 4 40.4	2 4 38.68	0.156	10 47 23.1	0.98
11	2 4 41.75	0.161	10 47 42.4	1.01	11 4 36.5	2 4 42.49	0.161	10 47 47.0	1.01
12	2 4 45.66	0.166	10 48 6.8	1.03	12 4 32.6	2 4 46.42	0.166	10 48 11.5	1.03
13	2 4 49.70	0.171	10 48 31.9	1.06	13 4 28.8	2 4 50.47	0.171	10 48 36.6	1.06
14	2 4 53.86	0.176	10 48 57.6	1.08	14 4 24.9	2 4 54.64	0.176	10 49 2.4	1.09
15	2 4 58.14	0.181	10 49 23.9	1.11	15 4 21.0	2 4 58.93	0.181	10 49 28.7	1.11
16	2 5 2.54	0.186	10 49 50.8	1.13	16 4 17.2	2 5 3.34	0.186	10 49 55.6	1.13
17	2 5 7.05	0.190	10 50 18.3	1.15	17 4 13.3	2 5 7.86	0.191	10 50 23.1	1.16
18	2 5 11.67	0.195	10 50 46.3	1.18	18 4 9.5	2 5 12.49	0.195	10 50 51.2	1.18
19	2 5 16.41	0.200	10 51 14.9	1.20	19 4 5.6	2 5 17.23	0.200	10 51 19.8	1.20
20	2 5 21.26	0.204	10 51 44.0	1.22	20 4 1.8	2 5 22.08	0.205	10 51 49.0	1.23
21	2 5 26.22	0.209	10 52 13.7	1.25	21 3 57.9	2 5 27.05	0.209	10 52 18.7	1.25
22	2 5 31.29	0.214	10 52 44.0	1.27	22 3 54.0	2 5 32.12	0.214	10 52 49.0	1.27
23	2 5 36.47	0.218	10 53 14.8	1.29	23 3 50.2	2 5 37.30	0.218	10 53 19.8	1.29
24	2 5 41.75	0.222	10 53 46.1	1.31	24 3 46.4	2 5 42.59	0.222	10 53 51.1	1.31
25	2 5 47.14	0.227	10 54 17.9	1.34	25 3 42.5	2 5 47.98	0.227	10 54 22.9	1.33
26	2 5 52.63	0.231	10 54 50.2	1.36	26 3 38.7	2 5 53.47	0.231	10 54 55.2	1.35
27	2 5 58.23	0.235	10 55 22.9	1.38	27 3 34.9	2 5 59.07	0.235	10 55 27.9	1.37
28	2 6 3.92	0.239	10 55 56.2	1.40	28 3 31.0	2 6 4.76	0.239	10 56 1.1	1.39
29	2 6 9.71	+0.244	+10 56 30.0	+1.42	29 3 27.2	2 6 10.55	+0.243	+10 56 34.9	+1.41

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
Mar. 1	2 6 9.71	+0.244	+10 56 30.0	+1.42	1 3 27.2	2 6 10.55	+0.243	+10 56 34.9	+1.41
2	2 6 15.61	0.248	10 57 4.3	1.44	2 3 23.4	2 6 16.44	0.247	10 57 9.1	1.43
3	2 6 21.60	0.251	10 57 39.0	1.45	3 3 19.5	2 6 22.43	0.251	10 57 43.8	1.45
4	2 6 27.68	0.255	10 58 14.1	1.47	4 3 15.7	2 6 28.51	0.255	10 58 18.9	1.47
5	2 6 33.86	0.260	10 58 49.7	1.49	5 3 11.9	2 6 34.69	0.259	10 58 54.5	1.49
6	2 6 40.14	0.264	10 59 25.7	1.51	6 3 8.0	2 6 40.96	0.263	10 59 30.5	1.51
7	2 6 46.51	0.267	11 0 2.2	1.53	7 3 4.2	2 6 47.32	0.267	11 0 6.9	1.53
8	2 6 52.96	0.271	11 0 39.1	1.54	8 3 0.4	2 6 53.77	0.270	11 0 43.7	1.54
9	2 6 59.50	0.274	11 1 16.3	1.56	9 2 56.5	2 7 0.30	0.274	11 1 20.9	1.56
10	2 7 6.13	0.278	11 1 54.0	1.58	10 2 52.7	2 7 6.92	0.278	11 1 58.5	1.58
11	2 7 12.85	0.282	11 2 32.1	1.60	11 2 48.9	2 7 13.64	0.281	11 2 36.6	1.59
12	2 7 19.65	0.285	11 3 10.6	1.61	12 2 45.1	2 7 20.43	0.285	11 3 15.0	1.61
13	2 7 26.53	0.288	11 3 49.4	1.63	13 2 41.3	2 7 27.30	0.288	11 3 53.8	1.63
14	2 7 33.49	0.292	11 4 28.6	1.64	14 2 37.5	2 7 34.25	0.291	11 4 32.9	1.64
15	2 7 40.53	0.295	11 5 8.2	1.66	15 2 33.7	2 7 41.28	0.295	11 5 12.4	1.65
16	2 7 47.65	0.298	11 5 48.1	1.67	16 2 29.8	2 7 48.39	0.298	11 5 52.2	1.66
17	2 7 54.85	0.301	11 6 28.3	1.68	17 2 26.0	2 7 55.57	0.301	11 6 32.3	1.68
18	2 8 2.12	0.304	11 7 8.8	1.70	18 2 22.2	2 8 2.82	0.304	11 7 12.8	1.70
19	2 8 9.45	0.307	11 7 49.7	1.71	19 2 18.4	2 8 10.15	0.307	11 7 53.7	1.71
20	2 8 16.86	0.310	11 8 30.9	1.72	20 2 14.6	2 8 17.55	0.310	11 8 34.8	1.72
21	2 8 24.34	0.313	11 9 12.3	1.73	21 2 10.8	2 8 25.02	0.313	11 9 16.1	1.73
22	2 8 31.89	0.316	11 9 54.0	1.74	22 2 7.0	2 8 32.55	0.315	11 9 57.7	1.74
23	2 8 39.50	0.318	11 10 36.0	1.76	23 2 3.2	2 8 40.14	0.318	11 10 39.6	1.75
24	2 8 47.16	0.321	11 11 18.3	1.77	24 1 59.4	2 8 47.79	0.320	11 11 21.8	1.76
25	2 8 54.89	0.323	11 12 0.8	1.78	25 1 55.6	2 8 55.50	0.323	11 12 4.2	1.77
26	2 9 2.68	0.326	11 12 43.5	1.79	26 1 51.8	2 9 3.28	0.325	11 12 46.8	1.78
27	2 9 10.52	0.328	11 13 26.5	1.80	27 1 48.0	2 9 11.11	0.327	11 13 29.7	1.79
28	2 9 18.42	0.330	11 14 9.7	1.80	28 1 44.2	2 9 18.99	0.330	11 14 12.8	1.80
29	2 9 26.37	0.332	11 14 53.1	1.81	29 1 40.4	2 9 26.93	0.332	11 14 56.1	1.81
30	2 9 34.38	0.335	11 15 36.6	1.82	30 1 36.6	2 9 34.92	0.334	11 15 39.5	1.81
31	2 9 42.44	0.337	11 16 20.3	1.82	31 1 32.8	2 9 42.96	0.336	11 16 23.1	1.82
Apr. 1	2 9 50.55	0.339	11 17 4.2	1.83	1 1 29.0	2 9 51.05	0.338	11 17 6.9	1.83
2	2 9 58.70	0.340	11 17 48.3	1.84	2 1 25.2	2 9 59.18	0.340	11 17 50.9	1.84
3	2 10 6.89	0.342	11 18 32.5	1.85	3 1 21.4	2 10 7.35	0.341	11 18 35.0	1.84
4	2 10 15.13	0.344	11 19 16.9	1.85	4 1 17.6	2 10 15.57	0.343	11 19 19.3	1.85
5	2 10 23.41	0.346	11 20 1.5	1.86	5 1 13.8	2 10 23.83	0.345	11 20 3.8	1.86
6	2 10 31.73	0.347	11 20 46.2	1.86	6 1 10.0	2 10 32.13	0.347	11 20 48.4	1.86
7	2 10 40.09	0.349	11 21 31.0	1.87	7 1 6.2	2 10 40.47	0.348	11 21 33.1	1.86
8	2 10 48.49	0.351	11 22 15.9	1.87	8 1 2.4	2 10 48.85	0.350	11 22 17.9	1.87
9	2 10 56.92	0.352	11 23 0.9	1.88	9 0 58.6	2 10 57.26	0.351	11 23 2.8	1.87
10	2 11 5.37	0.353	11 23 46.0	1.88	10 0 54.8	2 11 5.70	0.352	11 23 47.7	1.87
11	2 11 13.86	0.354	11 24 31.1	1.88	11 0 51.0	2 11 14.17	0.354	11 24 32.7	1.88
12	2 11 22.38	0.355	11 25 16.3	1.89	12 0 47.2	2 11 22.67	0.355	11 25 17.8	1.88
13	2 11 30.93	0.356	11 26 1.6	1.89	13 0 43.4	2 11 31.19	0.356	11 26 3.0	1.88
14	2 11 39.50	0.357	11 26 47.0	1.89	14 0 39.6	2 11 39.74	0.357	11 26 48.2	1.89
15	2 11 48.08	0.358	11 27 32.4	1.89	15 0 35.9	2 11 48.30	0.357	11 27 33.5	1.89
16	2 11 56.69	0.359	11 28 17.8	1.89	16 0 32.1	2 11 56.88	0.358	11 28 18.8	1.89
17	2 12 5.32	0.360	11 29 3.2	1.89	17 0 28.3	2 12 5.48	0.359	11 29 4.1	1.89
18	2 12 13.96	0.360	11 29 48.6	1.89	18 0 24.5	2 12 14.10	0.359	11 29 49.4	1.89
19	2 12 22.62	0.361	11 30 34.0	1.89	19 0 20.7	2 12 22.73	0.360	11 30 34.7	1.89
20	2 12 31.29	0.361	11 31 19.4	1.89	20 0 16.9	2 12 31.38	0.361	11 31 20.0	1.89
21	2 12 39.97	0.362	11 32 4.8	1.89	21 0 13.1	2 12 40.04	0.361	11 32 5.2	1.88
22	2 12 48.66	0.362	11 32 50.1	1.89	22 0 9.4	2 12 48.71	0.361	11 32 50.4	1.88
23	2 12 57.36	0.362	11 33 35.3	1.88	23 0 5.6	2 12 57.39	0.362	11 33 35.5	1.88
24	2 13 6.06	0.363	11 34 20.5	1.88	24 0 1.8	2 13 6.07	0.362	11 34 20.6	1.88
					24 23 58.0	2 13 14.75	0.362	11 35 5.5	1.87
25	2 13 14.76	0.363	11 35 5.6	1.88	25 23 54.2	2 13 23.42	0.362	11 35 50.4	1.87
26	2 13 23.46	0.363	11 35 50.6	1.87	26 23 50.4	2 13 32.10	0.362	11 36 35.2	1.86
27	2 13 32.16	0.362	11 36 35.5	1.87	27 23 46.6	2 13 40.78	0.362	11 37 19.9	1.86
28	2 13 40.86	0.362	11 37 20.3	1.87	28 23 42.8	2 13 49.46	0.361	11 38 4.6	1.86
29	2 13 49.56	0.362	11 38 5.1	1.86	29 23 39.1	2 13 58.13	0.361	11 38 49.2	1.85
30	2 13 58.25	0.362	11 38 49.8	1.86	30 23 35.3	2 14 6.79	0.361	11 39 33.6	1.85
31	2 14 6.93	+0.361	+11 39 34.3	+1.85	31 23 31.5	2 14 15.44	+0.360	+11 40 17.8	+1.84

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
May 1	2 14 6.93	+0.361	+11 39 34.3	+1.85	1 23 31.5	2 14 15.44	+0.360	+11 40 17.8	+1.84
2	2 14 15.60	0.361	11 40 18.7	1.85	2 23 27.7	2 14 24.07	0.359	11 41 1.9	1.84
3	2 14 24.26	0.360	11 41 2.9	1.84	3 23 23.9	2 14 32.69	0.359	11 41 45.9	1.83
4	2 14 32.91	0.360	11 41 47.0	1.84	4 23 20.1	2 14 41.30	0.358	11 42 29.8	1.83
5	2 14 41.54	0.359	11 42 31.0	1.83	5 23 16.3	2 14 49.89	0.358	11 43 13.5	1.82
6	2 14 50.16	0.359	11 43 14.8	1.82	6 23 12.5	2 14 58.47	0.357	11 43 57.0	1.81
7	2 14 58.76	0.358	11 43 58.4	1.81	7 23 8.7	2 15 7.02	0.356	11 44 40.3	1.80
8	2 15 7.33	0.357	11 44 41.8	1.80	8 23 5.0	2 15 15.55	0.355	11 45 23.4	1.79
9	2 15 15.88	0.356	11 45 25.0	1.80	9 23 1.2	2 15 24.06	0.354	11 46 6.3	1.78
10	2 15 24.41	0.355	11 46 8.1	1.79	10 22 57.4	2 15 32.54	0.353	11 46 49.0	1.77
11	2 15 32.91	0.354	11 46 50.9	1.78	11 22 53.6	2 15 40.99	0.352	11 47 31.5	1.76
12	2 15 41.38	0.353	11 47 33.5	1.77	12 22 49.8	2 15 49.42	0.350	11 48 13.7	1.75
13	2 15 49.83	0.352	11 48 15.8	1.76	13 22 46.0	2 15 57.81	0.349	11 48 55.7	1.74
14	2 15 58.24	0.350	11 48 57.9	1.75	14 22 42.2	2 16 6.17	0.347	11 49 37.5	1.73
15	2 16 6.62	0.348	11 49 39.8	1.74	15 22 38.4	2 16 14.49	0.346	11 50 19.0	1.72
16	2 16 14.96	0.347	11 50 21.4	1.73	16 22 34.6	2 16 22.77	0.344	11 51 0.3	1.71
17	2 16 23.26	0.345	11 51 2.7	1.71	17 22 30.8	2 16 31.02	0.343	11 51 41.2	1.70
18	2 16 31.53	0.344	11 51 43.7	1.70	18 22 27.0	2 16 39.22	0.341	11 52 21.8	1.69
19	2 16 39.75	0.342	11 52 24.4	1.69	19 22 23.2	2 16 47.38	0.339	11 53 2.1	1.67
20	2 16 47.93	0.340	11 53 4.8	1.68	20 22 19.4	2 16 55.50	0.337	11 53 42.1	1.66
21	2 16 56.07	0.338	11 53 44.9	1.66	21 22 15.6	2 17 3.57	0.335	11 54 21.8	1.65
22	2 17 4.15	0.336	11 54 24.7	1.65	22 22 11.8	2 17 11.59	0.333	11 55 1.3	1.64
23	2 17 12.19	0.334	11 55 4.2	1.64	23 22 8.0	2 17 19.55	0.331	11 55 40.4	1.62
24	2 17 20.18	0.332	11 55 43.4	1.62	24 22 4.2	2 17 27.46	0.329	11 56 19.1	1.61
25	2 17 28.11	0.329	11 56 22.2	1.61	25 22 0.4	2 17 35.32	0.327	11 57 7.5	1.59
26	2 17 35.99	0.327	11 57 0.7	1.60	26 21 56.6	2 17 43.14	0.325	11 57 35.6	1.58
27	2 17 43.82	0.325	11 57 38.9	1.58	27 21 52.8	2 17 50.90	0.322	11 58 13.3	1.56
28	2 17 51.59	0.323	11 58 16.7	1.57	28 21 49.0	2 17 58.61	0.320	11 58 50.7	1.55
29	2 17 59.31	0.320	11 58 54.1	1.55	29 21 45.2	2 18 6.26	0.317	11 59 27.7	1.53
30	2 18 6.97	0.318	11 59 31.1	1.54	30 21 41.4	2 18 13.84	0.315	12 0 4.3	1.52
31	2 18 14.57	0.315	12 0 7.8	1.52	31 21 37.6	2 18 21.36	0.312	12 0 40.5	1.50
June 1	2 18 22.10	0.312	12 0 44.1	1.50	1 21 33.8	2 18 28.82	0.309	12 1 16.3	1.48
2	2 18 29.57	0.310	12 1 19.9	1.49	2 21 30.0	2 18 36.21	0.306	12 1 51.7	1.47
3	2 18 36.97	0.307	12 1 55.4	1.47	3 21 26.2	2 18 43.53	0.304	12 2 26.8	1.45
4	2 18 44.31	0.304	12 2 30.5	1.45	4 21 22.4	2 18 50.78	0.301	12 3 1.4	1.43
5	2 18 51.58	0.301	12 3 5.2	1.44	5 21 18.6	2 18 57.97	0.298	12 3 35.6	1.42
6	2 18 58.77	0.298	12 3 39.4	1.42	6 21 14.8	2 19 5.09	0.295	12 4 9.4	1.40
7	2 19 5.90	0.295	12 4 13.2	1.40	7 21 11.0	2 19 12.13	0.292	12 4 42.7	1.38
8	2 19 12.95	0.292	12 4 46.6	1.38	8 21 7.1	2 19 19.09	0.288	12 5 15.5	1.36
9	2 19 19.92	0.289	12 5 19.5	1.36	9 21 3.3	2 19 25.97	0.285	12 5 47.9	1.34
10	2 19 26.81	0.286	12 5 51.9	1.34	10 20 59.5	2 19 32.78	0.282	12 6 19.9	1.32
11	2 19 33.63	0.283	12 6 23.9	1.32	11 20 55.7	2 19 39.51	0.279	12 6 51.5	1.30
12	2 19 40.37	0.279	12 6 55.5	1.30	12 20 51.8	2 19 46.16	0.275	12 7 22.6	1.28
13	2 19 47.03	0.276	12 7 26.6	1.28	13 20 48.0	2 19 52.73	0.272	12 7 53.1	1.26
14	2 19 53.60	0.272	12 7 57.1	1.26	14 20 44.2	2 19 59.21	0.268	12 8 23.2	1.24
15	2 20 0.09	0.269	12 8 27.2	1.24	15 20 40.4	2 20 5.61	0.265	12 8 52.7	1.22
16	2 20 6.49	0.265	12 8 56.8	1.22	16 20 36.6	2 20 11.92	0.261	12 9 21.8	1.20
17	2 20 12.80	0.261	12 9 25.9	1.20	17 20 32.7	2 20 18.13	0.257	12 9 50.4	1.18
18	2 20 19.02	0.257	12 9 54.5	1.18	18 20 28.9	2 20 24.26	0.254	12 10 18.5	1.16
19	2 20 25.15	0.254	12 10 22.6	1.16	19 20 25.0	2 20 30.30	0.250	12 10 46.1	1.14
20	2 20 31.19	0.250	12 10 50.2	1.14	20 20 21.2	2 20 36.24	0.246	12 11 13.1	1.12
21	2 20 37.13	0.246	12 11 17.2	1.11	21 20 17.4	2 20 42.09	0.242	12 11 39.7	1.10
22	2 20 42.98	0.242	12 11 43.7	1.09	22 20 13.6	2 20 47.84	0.238	12 12 5.7	1.07
23	2 20 48.74	0.238	12 12 9.7	1.07	23 20 9.7	2 20 53.50	0.234	12 12 31.2	1.05
24	2 20 54.40	0.234	12 12 35.2	1.05	24 20 5.9	2 20 59.06	0.230	12 12 56.2	1.03
25	2 20 59.96	0.230	12 13 0.2	1.03	25 20 2.0	2 21 4.53	0.226	12 13 20.6	1.01
26	2 21 5.42	0.226	12 13 24.6	1.00	26 19 58.2	2 21 9.90	0.222	12 13 44.5	0.98
27	2 21 10.79	0.222	12 13 48.4	0.98	27 19 54.4	2 21 15.17	0.218	12 14 7.8	0.96
28	2 21 16.06	0.217	12 14 11.7	0.96	28 19 50.5	2 21 20.34	0.213	12 14 30.6	0.94
29	2 21 21.22	0.213	12 14 34.5	0.94	29 19 46.7	2 21 25.40	0.209	12 14 32.8	0.91
30	2 21 26.28	0.209	12 14 56.7	0.91	30 19 42.8	2 21 30.36	0.205	12 15 14.5	0.89
31	2 21 31.24	+0.204	+12 15 18.3	+0.89	31 19 39.0	2 21 35.22	+0.230	+12 15 35.6	+0.87

Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
1877.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ′ ″	″	d h m	h m s	s	° ′ ″	″
July 1	2 21 31.24	+0.204	+12 15 18.3	+0.89	1 19 39.0	2 21 35.22	+0.200	+12 15 35.6	+0.87
2	2 21 36.09	0.200	12 15 39.3	0.86	2 19 35.1	2 21 39.97	0.196	12 15 56.2	0.84
3	2 21 40.83	0.195	12 15 59.8	0.84	3 19 31.2	2 21 44.61	0.191	12 16 16.1	0.82
4	2 21 45.46	0.191	12 16 19.7	0.82	4 19 27.4	2 21 49.14	0.186	12 16 35.4	0.79
5	2 21 49.98	0.186	12 16 39.0	0.79	5 19 23.5	2 21 53.56	0.182	12 16 54.2	0.77
6	2 21 54.40	0.182	12 16 57.7	0.77	6 19 19.7	2 21 57.88	0.178	12 17 12.4	0.75
7	2 21 58.71	0.177	12 17 15.9	0.74	7 19 15.8	2 22 2.08	0.173	12 17 30.0	0.72
8	2 22 2.90	0.172	12 17 33.4	0.72	8 19 12.0	2 22 6.17	0.168	12 17 47.0	0.70
9	2 22 6.97	0.167	12 17 50.3	0.69	9 19 8.1	2 22 10.14	0.163	12 18 3.4	0.67
10	2 22 10.93	0.162	12 18 6.6	0.67	10 19 4.2	2 22 13.99	0.158	12 18 19.2	0.64
11	2 22 14.77	0.158	12 18 22.3	0.64	11 19 0.3	2 22 17.74	0.154	12 18 34.3	0.62
12	2 22 18.50	0.153	12 18 37.3	0.61	12 18 56.5	2 22 21.37	0.149	12 18 48.8	0.59
13	2 22 22.12	0.148	12 18 51.8	0.59	13 18 52.6	2 22 24.88	0.144	12 19 2.8	0.57
14	2 22 25.62	0.143	12 19 5.7	0.56	14 18 48.7	2 22 28.28	0.139	12 19 16.1	0.54
15	2 22 29.00	0.138	12 19 18.9	0.54	15 18 44.8	2 22 31.56	0.134	12 19 28.8	0.52
16	2 22 32.26	0.133	12 19 31.5	0.51	16 18 41.0	2 22 34.71	0.129	12 19 40.9	0.49
17	2 22 35.39	0.128	12 19 43.5	0.49	17 18 37.1	2 22 37.74	0.124	12 19 52.4	0.47
18	2 22 38.40	0.123	12 19 54.9	0.46	18 18 33.2	2 22 40.65	0.119	12 20 3.3	0.44
19	2 22 41.29	0.118	12 20 5.7	0.44	19 18 29.3	2 22 43.44	0.114	12 20 13.6	0.41
20	2 22 44.06	0.113	12 20 15.9	0.41	20 18 25.4	2 22 46.11	0.109	12 20 23.2	0.39
21	2 22 46.71	0.108	12 20 25.4	0.38	21 18 21.5	2 22 48.66	0.104	12 20 32.2	0.36
22	2 22 49.24	0.103	12 20 34.2	0.35	22 18 17.6	2 22 51.08	0.098	12 20 40.6	0.34
23	2 22 51.64	0.098	12 20 42.4	0.33	23 18 13.8	2 22 53.38	0.093	12 20 48.3	0.31
24	2 22 53.92	0.092	12 20 50.0	0.30	24 18 9.9	2 22 55.56	0.088	12 20 55.4	0.28
25	2 22 56.07	0.087	12 20 57.0	0.28	25 18 6.0	2 22 57.62	0.083	12 21 1.9	0.26
26	2 22 58.10	0.082	12 21 3.3	0.25	26 18 2.1	2 22 59.55	0.078	12 21 7.7	0.23
27	2 23 0.01	0.077	12 21 9.0	0.22	27 17 58.2	2 23 1.36	0.073	12 21 12.9	0.20
28	2 23 1.80	0.072	12 21 14.1	0.20	28 17 54.3	2 23 3.05	0.068	12 21 17.5	0.18
29	2 23 3.46	0.066	12 21 18.5	0.17	29 17 50.3	2 23 4.61	0.062	12 21 21.4	0.15
30	2 23 4.99	0.061	12 21 22.3	0.15	30 17 46.4	2 23 6.04	0.057	12 21 24.7	0.12
31	2 23 6.39	0.056	12 21 25.5	0.12	31 17 42.5	2 23 7.35	0.052	12 21 27.4	0.10
Aug. 1	2 23 7.67	0.051	12 21 28.0	0.09	1 17 38.6	2 23 8.53	0.047	12 21 29.5	0.07
2	2 23 8.82	0.045	12 21 29.9	0.06	2 17 34.7	2 23 9.59	0.041	12 21 30.9	0.04
3	2 23 9.85	0.040	12 21 31.1	0.04	3 17 30.8	2 23 10.52	0.036	12 21 31.6	+0.02
4	2 23 10.75	0.035	12 21 31.7	+0.01	4 17 26.9	2 23 11.32	0.031	12 21 31.7	−0.01
5	2 23 11.51	0.029	12 21 31.6	−0.02	5 17 22.9	2 23 11.99	0.025	12 21 31.2	0.03
6	2 23 12.15	0.024	12 21 30.9	0.04	6 17 19.0	2 23 12.53	0.020	12 21 30.1	0.06
7	2 23 12.66	0.019	12 21 29.6	0.07	7 17 15.1	2 23 12.94	0.015	12 21 28.3	0.09
8	2 23 13.04	0.013	12 21 27.6	0.10	8 17 11.1	2 23 13.23	0.009	12 21 25.8	0.12
9	2 23 13.29	0.008	12 21 25.0	0.12	9 17 7.2	2 23 13.39	+0.004	12 21 22.7	0.14
10	2 23 13.41	+0.002	12 21 21.7	0.15	10 17 3.3	2 23 13.42	-0.001	12 21 19.0	0.17
11	2 23 13.40	−0.003	12 21 17.8	0.18	11 16 59.4	2 23 13.32	0.007	12 21 14.7	0.19
12	2 23 13.27	0.008	12 21 13.4	0.20	12 16 55.4	2 23 13.10	0.012	12 21 9.8	0.22
13	2 23 13.01	0.014	12 21 8.2	0.23	13 16 51.5	2 23 12.75	0.017	12 21 4.2	0.25
14	2 23 12.62	0.019	12 21 2.4	0.25	14 16 47.6	2 23 12.27	0.022	12 20 58.0	0.27
15	2 23 12.10	0.024	12 20 56.0	0.28	15 16 43.6	2 23 11.67	0.028	12 20 51.2	0.30
16	2 23 11.46	0.029	12 20 49.0	0.30	16 16 39.7	2 23 10.94	0.033	12 20 43.8	0.32
17	2 23 10.69	0.035	12 20 41.4	0.33	17 16 35.7	2 23 10.08	0.038	12 20 35.8	0.35
18	2 23 9.79	0.040	12 20 33.2	0.36	18 16 31.8	2 23 9.10	0.044	12 20 27.1	0.37
19	2 23 8.77	0.045	12 20 24.3	0.38	19 16 27.8	2 23 7.99	0.049	12 20 17.9	0.39
20	2 23 7.62	0.050	12 20 14.8	0.41	20 16 23.9	2 23 6.76	0.054	12 20 8.1	0.42
21	2 23 6.35	0.055	12 20 4.8	0.43	21 16 19.9	2 23 5.42	0.059	12 19 57.7	0.45
22	2 23 4.96	0.061	12 19 54.2	0.46	22 16 16.0	2 23 3.94	0.064	12 19 46.7	0.47
23	2 23 3.44	0.066	12 19 42.9	0.48	23 16 12.0	2 23 2.35	0.069	12 19 35.1	0.50
24	2 23 1.80	0.071	12 19 31.1	0.51	24 16 8.0	2 23 0.63	0.074	12 19 22.8	0.52
25	2 23 0.04	0.076	12 19 18.6	0.53	25 16 4.1	2 22 58.79	0.079	12 19 9.9	0.55
26	2 22 58.16	0.081	12 19 5.5	0.56	26 16 0.1	2 22 56.84	0.084	12 18 56.5	0.57
27	2 22 56.16	0.086	12 18 51.9	0.58	27 15 56.1	2 22 54.76	0.089	12 18 42.6	0.59
28	2 22 54.04	0.091	12 18 37.8	0.60	28 15 52.2	2 22 52.57	0.094	12 18 28.2	0.61
29	2 22 51.80	0.096	12 18 23.1	0.63	29 15 48.2	2 22 50.26	0.099	12 18 13.2	0.64
30	2 22 49.44	0.101	12 18 7.8	0.65	30 15 44.2	2 22 47.83	0.104	12 17 57.5	0.66
31	2 22 46.96	−0.106	+12 17 51.9	−0.67	31 15 40.2	2 22 45.28	−0.109	+12 17 41.3	−0.69

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	☿	♀	♂	☿	♀	♂	☿	♀	♂
Jan. 1	7″.36	6″.46	4″.31	2″.78	6″.24	2″.46	0ˢ.20	0ˢ.44	0ˢ.17
6	8.09	6.34	4.40	3.05	6.13	2.51	0.22	0.44	0.17
11	9.16	6.23	4.49	3.46	6.03	2.56	0.24	0.43	0.18
16	10.64	6.13	4.59	4.02	5.93	2.62	0.28	0.43	0.18
21	12.31	6.04	4.70	4.65	5.84	2.68	0.32	0.42	0.19
26	13.39	5.95	4.81	5.05	5.75	2.74	0.35	0.42	0.19
31	13.24	5.86	4.93	5.00	5.66	2.81	0.35	0.41	0.20
Feb. 5	12.26	5.78	5.05	4.63	5.58	2.88	0.32	0.40	0.20
10	11.08	5.71	5.18	4.18	5.51	2.96	0.29	0.39	0.21
15	10.04	5.64	5.32	3.79	5.45	3.04	0.27	0.38	0.22
20	9.20	5.58	5.46	3.47	5.39	3.12	0.25	0.38	0.23
25	8.54	5.52	5.62	3.22	5.33	3.21	0.23	0.37	0.23
Mar. 2	8.01	5.46	5.79	3.02	5.27	3.31	0.21	0.36	0.24
7	7.59	5.41	5.97	2.86	5.22	3.41	0.20	0.36	0.25
12	7.24	5.36	6.15	2.73	5.18	3.52	0.19	0.35	0.26
17	6.97	5.32	6.35	2.63	5.14	3.63	0.18	0.35	0.26
22	6.77	5.28	6.55	2.56	5.10	3.74	0.17	0.34	0.27
27	6.63	5.25	6.77	2.50	5.07	3.86	0.17	0.34	0.28
April 1	6.57	5.22	7.00	2.48	5.04	3.99	0.17	0.34	0.29
6	6.62	5.19	7.25	2.50	5.01	4.12	0.17	0.33	0.30
11	6.83	5.17	7.50	2.58	4.99	4.27	0.18	0.33	0.31
16	7.24	5.15	7.77	2.73	4.97	4.43	0.19	0.33	0.32
21	7.90	5.13	8.07	2.98	4.96	4.60	0.21	0.34	0.33
26	8.82	5.12	8.39	3.33	4.95	4.78	0.24	0.34	0.34
May 1	10.00	5.11	8.72	3.77	4.94	4.98	0.27	0.34	0.35
6	11.40	5.11	9.08	4.30	4.94	5.18	0.31	0.35	0.36
11	12.92	5.11	9.46	4.88	4.94	5.40	0.36	0.35	0.38
16	14.42	5.11	9.86	5.44	4.95	5.63	0.39	0.35	0.39
21	15.60	5.12	10.28	5.89	4.95	5.88	0.42	0.35	0.41
26	16.11	5.13	10.72	6.08	4.96	6.13	0.43	0.36	0.42
31	15.80	5.15	11.19	5.97	4.98	6.40	0.42	0.36	0.44
June 5	14.84	5.17	11.70	5.60	5.00	6.69	0.39	0.36	0.46
10	13.50	5.20	12.25	5.09	5.02	7.00	0.35	0.37	0.48
15	12.08	5.23	12.83	4.56	5.05	7.33	0.32	0.37	0.50
20	10.73	5.27	13.46	4.05	5.09	7.69	0.28	0.37	0.52
25	9.53	5.31	14.11	3.60	5.13	8.06	0.25	0.37	0.55
30	8.52	5.36	14.80	3.22	5.18	8.45	0.23	0.37	0.58
July 5	7.72	5.41	15.52	2.91	5.23	8.86	0.21	0.37	0.60
10	7.14	5.47	16.29	2.70	5.28	9.31	0.20	0.37	0.63
15	6.77	5.53	17.08	2.56	5.34	9.77	0.19	0.38	0.66
20	6.61	5.60	17.91	2.50	5.40	10.23	0.18	0.38	0.69
25	6.61	5.67	18.76	2.50	5.47	10.72	0.18	0.38	0.72
30	6.72	5.75	19.63	2.54	5.56	11.22	0.18	0.38	0.76
Aug. 4	6.93	5.84	20.48	2.62	5.65	11.71	0.18	0.39	0.79
9	7.20	5.94	21.30	2.72	5.74	12.16	0.18	0.39	0.82
14	7.55	6.04	22.02	2.85	5.84	12.57	0.19	0.40	0.85
19	7.97	6.15	22.63	3.01	5.95	12.94	0.20	0.40	0.88
24	8.49	6.27	23.10	3.20	6.06	13.22	0.21	0.41	0.90
29	9.12	6.40	23.39	3.44	6.18	13.37	0.23	0.41	0.91
Sept. 3	9.88	6.54	23.46	3.73	6.31	13.41	0.25	0.42	0.92
8	10.80	6.68	23.33	4.08	6.45	13.34	0.27	0.43	0.91
13	11.87	6.84	22.97	4.48	6.61	13.13	0.30	0.44	0.90
18	12.93	7.01	22.41	4.88	6.78	12.79	0.33	0.46	0.88
23	13.58	7.19	21.68	5.13	6.95	12.37	0.34	0.48	0.86
28	13.25	7.38	20.85	5.00	7.13	11.91	0.33	0.50	0.82
Oct. 3	11.91	7.59	19.96	4.50	7.33	11.41	0.30	0.52	0.78
8	10.23	7.82	19.02	3.86	7.55	10.89	0.26	0.54	0.74
13	8.81	8.06	18.08	3.32	7.79	10.35	0.23	0.56	0.71
18	7.79	8.32	17.14	2.94	8.04	9.80	0.20	0.58	0.67
23	7.12	8.60	16.23	2.69	8.31	9.27	0.18	0.60	0.63

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	☿	♀	♂	☿	♀	♂	☿	♀	♂
Oct. 28	6″.68	8″.91	15″.35	2″.52	8″.61	8″.77	0s.17	0s.63	0s.59
Nov. 2	6.40	9.24	14.52	2.42	8.93	8.30	0.16	0.66	0.56
7	6.22	9.59	13.74	2.35	9.27	7.85	0.16	0.69	0.53
12	6.13	9.98	13.02	2.31	9.65	7.44	0.16	0.72	0.50
17	6.11	10.42	12.36	2.30	10.06	7.06	0.16	0.75	0.47
22	6.14	10.90	11.74	2.32	10.52	6.70	0.17	0.78	0.45
27	6.24	11.42	11.16	2.36	11.02	6.38	0.17	0.81	0.43
Dec. 2	6.40	11.99	10.62	2.42	11.57	6.07	0.18	0.84	0.41
7	6.66	12.62	10.12	2.51	12.20	5.78	0.19	0.88	0.39
12	7.02	13.33	9.65	2.65	12.89	5.51	0.20	0.92	0.37
17	7.55	14.13	9.21	2.85	13.65	5.26	0.21	0.96	0.35
22	8.32	15.03	8.80	3.14	14.50	5.03	0.23	1.01	0.33
27	9.43	16.03	8.43	3.56	15.47	4.82	0.26	1.07	0.32
32	10.92	17.15	8.09	4.12	16.57	4.63	0.29	1.14	0.31

Mean Noon.	♃	♄	♅	♃	♄	♅	♃	♄	♅
Jan. 1	1″.43	0″.86	0″.50	15″.15	7″.60	1″.90	1s.16	0s.55	0s.13
11	1.44	0.85	0.50	15.34	7.51	1.91	1.17	0.55	0.13
21	1.46	0.84	0.51	15.58	7.44	1.92	1.19	0.54	0.13
31	1.49	0.84	0.51	15.87	7.38	1.93	1.22	0.54	0.13
Feb. 10	1.53	0.83	0.51	16.22	7.34	1.93	1.25	0.53	0.13
20	1.56	0.83	0.51	16.62	7.32	1.93	1.28	0.53	0.13
Mar. 2	1.61	0.83	0.51	17.07	7.31	1.92	1.32	0.53	0.13
12	1.66	0.83	0.50	17.57	7.32	1.91	1.36	0.53	0.13
22	1.70	0.83	0.50	18.12	7.35	1.89	1.40	0.53	0.13
April 1	1.75	0.84	0.50	18.70	7.39	1.87	1.45	0.53	0.13
11	1.81	0.84	0.50	19.30	7.45	1.86	1.49	0.54	0.13
21	1.87	0.85	0.49	19.91	7.53	1.84	1.54	0.54	0.13
May 1	1.93	0.86	0.49	20.50	7.62	1.82	1.59	0.55	0.13
11	1.98	0.88	0.48	21.04	7.73	1.81	1.63	0.55	0.13
21	2.02	0.89	0.48	21.51	7.85	1.79	1.66	0.56	0.13
31	2.05	0.90	0.47	21.88	7.98	1.78	1.69	0.57	0.13
June 10	2.08	0.92	0.47	22.11	8.12	1.77	1.71	0.58	0.12
20	2.09	0.93	0.47	22.20	8.26	1.76	1.71	0.59	0.12
30	2.08	0.95	0.46	22.14	8.40	1.75	1.70	0.60	0.12
July 10	2.06	0.97	0.46	21.93	8.54	1.74	1.69	0.61	0.12
20	2.03	0.98	0.46	21.58	8.67	1.74	1.67	0.62	0.12
30	1.99	1.00	0.46	21.13	8.79	1.73	1.64	0.63	0.12
Aug. 9	1.94	1.01	0.46	20.61	8.89	1.73	1.59	0.64	0.12
19	1.89	1.02	0.46	20.04	8.97	1.73	1.54	0.64	0.12
29	1.83	1.02	0.46	19.46	9.02	1.74	1.50	0.65	0.12
Sept. 8	1.78	1.02	0.46	18.87	9.04	1.74	1.46	0.65	0.12
18	1.72	1.02	0.46	18.31	9.03	1.75	1.41	0.65	0.12
28	1.67	1.02	0.46	17.79	8.99	1.77	1.37	0.65	0.12
Oct. 8	1.62	1.01	0.47	17.30	8.92	1.78	1.34	0.64	0.12
18	1.59	1.00	0.47	16.86	8.82	1.79	1.30	0.64	0.13
28	1.55	0.99	0.47	16.48	8.70	1.81	1.27	0.63	0.13
Nov. 7	1.52	0.97	0.48	16.14	8.57	1.83	1.25	0.62	0.13
17	1.49	0.95	0.48	15.87	8.43	1.84	1.23	0.61	0.13
27	1.47	0.94	0.49	15.64	8.29	1.86	1.21	0.60	0.13
Dec. 7	1.45	0.92	0.49	15.46	8.15	1.87	1.19	0.59	0.13
17	1.44	0.91	0.50	15.35	8.01	1.89	1.18	0.58	0.13
27	1.44	0.89	0.50	15.28	7.88	1.90	1.18	0.57	0.13
37	1.43	0.88	0.50	15.26	7.76	1.90	1.17	0.56	0.13

Horizontal Parallax of Neptune, 0″.30, Jan. 1 to Feb. 2; July 19 to Sept. 22; after Dec. 2.
" " " 0″.29, Feb. 3 to July 18.
" " " 0″.31, Sept. 23 to Dec. 2.

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	☿	♀	♂	☿	♀	♂	☿	♀	♂
	″	″	″	″	″	″	s	s	s
Jan. 1	7.36	6.46	4.31	2.78	6.24	2.46	0.20	0.44	0.17
6	8.09	6.34	4.40	3.05	6.13	2.51	0.22	0.44	0.17
11	9.16	6.23	4.49	3.46	6.03	2.56	0.24	0.43	0.18
16	10.64	6.13	4.59	4.02	5.93	2.62	0.28	0.43	0.18
21	12.31	6.04	4.70	4.65	5.84	2.68	0.32	0.42	0.19
26	13.39	5.95	4.81	5.05	5.75	2.74	0.35	0.42	0.19
31	13.24	5.86	4.93	5.00	5.66	2.81	0.35	0.41	0.20
Feb. 5	12.26	5.78	5.05	4.63	5.58	2.88	0.32	0.40	0.20
10	11.08	5.71	5.18	4.18	5.51	2.96	0.29	0.39	0.21
15	10.04	5.64	5.32	3.79	5.45	3.04	0.27	0.38	0.22
20	9.20	5.58	5.46	3.47	5.39	3.12	0.25	0.38	0.23
25	8.54	5.52	5.62	3.22	5.33	3.21	0.23	0.37	0.23
Mar. 2	8.01	5.46	5.79	3.02	5.27	3.31	0.21	0.36	0.24
7	7.59	5.41	5.97	2.86	5.22	3.41	0.20	0.36	0.25
12	7.24	5.36	6.15	2.73	5.18	3.52	0.19	0.35	0.26
17	6.97	5.32	6.35	2.63	5.14	3.63	0.18	0.35	0.26
22	6.77	5.28	6.55	2.56	5.10	3.74	0.17	0.34	0.27
27	6.63	5.25	6.77	2.50	5.07	3.86	0.17	0.34	0.28
April 1	6.57	5.22	7.00	2.48	5.04	3.99	0.17	0.34	0.29
6	6.62	5.19	7.25	2.50	5.01	4.12	0.17	0.33	0.30
11	6.83	5.17	7.50	2.58	4.99	4.27	0.18	0.33	0.31
16	7.24	5.15	7.77	2.73	4.97	4.43	0.19	0.33	0.32
21	7.90	5.13	8.07	2.98	4.96	4.60	0.21	0.34	0.33
26	8.82	5.12	8.39	3.33	4.95	4.78	0.24	0.34	0.34
May 1	10.00	5.11	8.72	3.77	4.94	4.98	0.27	0.34	0.35
6	11.40	5.11	9.08	4.30	4.94	5.18	0.31	0.35	0.36
11	12.92	5.11	9.46	4.88	4.94	5.40	0.36	0.35	0.38
16	14.42	5.11	9.86	5.44	4.95	5.63	0.39	0.35	0.39
21	15.60	5.12	10.28	5.89	4.95	5.88	0.42	0.35	0.41
26	16.11	5.13	10.72	6.08	4.96	6.13	0.43	0.36	0.42
31	15.80	5.15	11.19	5.97	4.98	6.40	0.42	0.36	0.44
June 5	14.84	5.17	11.70	5.60	5.00	6.69	0.39	0.36	0.46
10	13.50	5.20	12.25	5.09	5.02	7.00	0.35	0.37	0.48
15	12.08	5.23	12.83	4.56	5.05	7.33	0.32	0.37	0.50
20	10.73	5.27	13.46	4.05	5.09	7.69	0.28	0.37	0.52
25	9.53	5.31	14.11	3.60	5.13	8.06	0.25	0.37	0.55
30	8.52	5.36	14.80	3.22	5.18	8.45	0.23	0.37	0.58
July 5	7.72	5.41	15.52	2.91	5.23	8.86	0.21	0.37	0.60
10	7.14	5.47	16.29	2.70	5.28	9.31	0.20	0.37	0.63
15	6.77	5.53	17.08	2.56	5.34	9.77	0.19	0.38	0.66
20	6.61	5.60	17.91	2.50	5.40	10.23	0.18	0.38	0.69
25	6.61	5.67	18.76	2.50	5.47	10.72	0.18	0.38	0.72
30	6.72	5.75	19.63	2.54	5.56	11.22	0.18	0.38	0.76
Aug. 4	6.93	5.84	20.48	2.62	5.65	11.71	0.18	0.39	0.79
9	7.20	5.94	21.30	2.72	5.74	12.16	0.18	0.39	0.82
14	7.55	6.04	22.02	2.85	5.84	12.57	0.19	0.40	0.85
19	7.97	6.15	22.63	3.01	5.95	12.94	0.20	0.40	0.88
24	8.49	6.27	23.10	3.20	6.06	13.22	0.21	0.41	0.90
29	9.12	6.40	23.39	3.44	6.18	13.37	0.23	0.41	0.91
Sept. 3	9.88	6.54	23.46	3.73	6.31	13.41	0.25	0.42	0.92
8	10.80	6.68	23.33	4.08	6.45	13.34	0.27	0.43	0.91
13	11.87	6.84	22.97	4.48	6.61	13.13	0.30	0.44	0.90
18	12.93	7.01	22.41	4.88	6.78	12.79	0.33	0.46	0.88
23	13.58	7.19	21.68	5.13	6.95	12.37	0.34	0.48	0.86
28	13.25	7.38	20.85	5.00	7.13	11.91	0.33	0.50	0.82
Oct. 3	11.91	7.59	19.96	4.50	7.33	11.41	0.30	0.52	0.78
8	10.23	7.82	19.02	3.86	7.55	10.89	0.26	0.54	0.74
13	8.81	8.06	18.08	3.32	7.79	10.35	0.23	0.56	0.71
18	7.79	8.32	17.14	2.94	8.04	9.80	0.20	0.58	0.67
23	7.12	8.60	16.23	2.69	8.31	9.27	0.18	0.60	0.63

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	☿	♀	♂	☿	♀	♂	☿	♀	♂
Oct. 28	6″.68	8″.91	15″.35	2″.52	8″.61	8″.77	0s.17	0s.63	0s.59
Nov. 2	6.40	9.24	14.52	2.42	8.93	8.30	0.16	0.66	0.56
7	6.22	9.59	13.74	2.35	9.27	7.85	0.16	0.69	0.53
12	6.13	9.98	13.02	2.31	9.65	7.44	0.16	0.72	0.50
17	6.11	10.42	12.36	2.30	10.06	7.06	0.16	0.75	0.47
22	6.14	10.90	11.74	2.32	10.52	6.70	0.17	0.78	0.45
27	6.24	11.42	11.16	2.36	11.02	6.38	0.17	0.81	0.43
Dec. 2	6.40	11.99	10.62	2.42	11.57	6.07	0.18	0.84	0.41
7	6.66	12.62	10.12	2.51	12.20	5.78	0.19	0.88	0.39
12	7.02	13.33	9.65	2.65	12.89	5.51	0.20	0.92	0.37
17	7.55	14.13	9.21	2.85	13.65	5.26	0.21	0.96	0.35
22	8.32	15.03	8.80	3.14	14.50	5.03	0.23	1.01	0.33
27	9.43	16.03	8.43	3.56	15.47	4.82	0.26	1.07	0.32
32	10.92	17.15	8.09	4.12	16.57	4.63	0.29	1.14	0.31
Mean Noon.	♃	♄	♅	♃	♄	♅	♃	♄	♅
Jan. 1	1″.43	0″.86	0″.50	15″.15	7″.60	1″.90	1s.16	0s.55	0s.13
11	1.44	0.85	0.50	15.34	7.51	1.91	1.17	0.55	0.13
21	1.46	0.84	0.51	15.58	7.44	1.92	1.19	0.54	0.13
31	1.49	0.84	0.51	15.87	7.38	1.93	1.22	0.54	0.13
Feb. 10	1.53	0.83	0.51	16.22	7.34	1.93	1.25	0.53	0.13
20	1.56	0.83	0.51	16.62	7.32	1.93	1.28	0.53	0.13
Mar. 2	1.61	0.83	0.51	17.07	7.31	1.92	1.32	0.53	0.13
12	1.66	0.83	0.50	17.57	7.32	1.91	1.36	0.53	0.13
22	1.70	0.83	0.50	18.12	7.35	1.89	1.40	0.53	0.13
April 1	1.75	0.84	0.50	18.70	7.39	1.87	1.45	0.53	0.13
11	1.81	0.84	0.50	19.30	7.45	1.86	1.49	0.54	0.13
21	1.87	0.85	0.49	19.91	7.53	1.84	1.54	0.54	0.13
May 1	1.93	0.86	0.49	20.50	7.62	1.82	1.59	0.55	0.13
11	1.98	0.88	0.48	21.04	7.73	1.81	1.63	0.55	0.13
21	2.02	0.89	0.48	21.51	7.85	1.79	1.66	0.56	0.13
31	2.05	0.90	0.47	21.88	7.98	1.78	1.69	0.57	0.13
June 10	2.08	0.92	0.47	22.11	8.12	1.77	1.71	0.58	0.12
20	2.09	0.93	0.47	22.20	8.26	1.76	1.71	0.59	0.12
30	2.08	0.95	0.46	22.14	8.40	1.75	1.70	0.60	0.12
July 10	2.06	0.97	0.46	21.93	8.54	1.74	1.69	0.61	0.12
20	2.03	0.98	0.46	21.58	8.67	1.74	1.67	0.62	0.12
30	1.99	1.00	0.46	21.13	8.79	1.73	1.64	0.63	0.12
Aug. 9	1.94	1.01	0.46	20.61	8.89	1.73	1.59	0.64	0.12
19	1.89	1.02	0.46	20.04	8.97	1.73	1.54	0.64	0.12
29	1.83	1.02	0.46	19.46	9.02	1.74	1.50	0.65	0.12
Sept. 8	1.78	1.02	0.46	18.87	9.04	1.74	1.46	0.65	0.12
18	1.72	1.02	0.46	18.31	9.03	1.75	1.41	0.65	0.12
28	1.67	1.02	0.46	17.79	8.99	1.77	1.37	0.65	0.12
Oct. 8	1.62	1.01	0.47	17.30	8.92	1.78	1.34	0.64	0.12
18	1.59	1.00	0.47	16.86	8.82	1.79	1.30	0.64	0.13
28	1.55	0.99	0.47	16.48	8.70	1.81	1.27	0.63	0.13
Nov. 7	1.52	0.97	0.48	16.14	8.57	1.83	1.25	0.62	0.13
17	1.49	0.95	0.48	15.87	8.43	1.84	1.23	0.61	0.13
27	1.47	0.94	0.49	15.64	8.29	1.86	1.21	0.60	0.13
Dec. 7	1.45	0.92	0.49	15.46	8.15	1.87	1.19	0.59	0.13
17	1.44	0.91	0.50	15.35	8.01	1.89	1.18	0.58	0.13
27	1.44	0.89	0.50	15.28	7.88	1.90	1.18	0.57	0.13
37	1.43	0.88	0.50	15.26	7.76	1.90	1.17	0.56	0.13

Horizontal Parallax of Neptune, 0″.30, Jan. 1 to Feb. 2; July 19 to Sept. 22; after Dec. 2.
" " " 0″.29, Feb. 3 to July 18.
" " " 0″.31, Sept. 23 to Dec. 2.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.					
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.			λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
							°	′	″	″	″	9.99
Jan. 1.0	+.1956839	6591	—.8838788	8990	—.3835410	5072	281	28	49.3	44.0	+0.27	26317
1.5	.2042459	2207	.8822507	2712	.3828348	8012	281	59	23.8	18.4	0.22	26335
2.0	.2127922	7666	.8805541	5749	.3820991	0657	282	29	58.3	52.8	0.16	26359
2.5	.2213224	2964	.8787892	8102	.3813338	3006	283	0	32.8	27.2	0.10	26390
3.0	.2298358	8094	.8769563	9776	.3805388	5058	283	31	7.3	1.6	+0.04	26428
3.5	.2383316	3048	.8750553	0769	.3797142	6814	284	1	41.8	36.0	—0.02	26473
4.0	.2468090	7818	.8730864	1083	.3788691	8275	284	32	16.4	10.5	0.08	26525
4.5	.2552676	2400	.8710496	0718	.3779765	9441	285	2	51.0	45.0	0.14	26582
5.0	.2637068	6788	.8689449	9674	.3770636	0314	285	33	25.6	19.5	0.21	26645
5.5	.2721259	0975	.8667726	7954	.3761213	0893	286	3	60.2	54.0	0.27	26715
6.0	.2805242	4955	.8645329	5560	.3751498	1181	286	34	34.9	28.6	0.33	26792
6.5	.2889011	8720	.8622259	2493	.3741491	1176	287	5	9.6	3.2	0.39	26874
7.0	.2972559	2265	.8598517	8754	.3731192	0879	287	35	44.3	37.8	0.44	26961
7.5	.3055880	5582	.8574105	4345	.3720691	0290	288	6	19.0	12.4	0.49	27054
8.0	.3138968	8667	.8549024	9268	.3709719	9411	288	36	53.8	47.1	0.53	27153
8.5	.3221815	1510	.8523276	3523	.3698548	8242	289	7	28.5	21.7	0.57	27257
9.0	.3304413	4105	.8496861	7111	.3687088	6785	289	37	63.2	56.3	0.60	27367
9.5	.2386757	6446	.8469782	0036	.3675339	5038	290	8	37.9	30.9	0.62	27479
10.0	.3468840	8526	.8442042	2300	.3663303	3005	290	39	12.6	5.5	0.64	27597
10.5	.3550654	0337	.8413642	3903	.3650980	0684	291	9	47.2	40.1	0.64	27720
11.0	.3632194	1874	.8384584	4849	.3638371	8078	291	40	21.8	14.6	0.64	27847
11.5	.3713452	3129	.8354871	5140	.3625477	5187	292	10	56.3	49.0	0.63	27979
12.0	.3794422	4096	.8324504	4777	.3612300	2013	292	41	30.8	23.4	0.62	28115
12.5	.3875098	4769	.8293487	3763	.3598840	8556	293	11	65.1	57.6	0.60	28255
13.0	.3955473	5141	.8261822	2102	.3585099	4818	293	42	39.4	31.8	0.57	28399
13.5	.4035539	[illegible]204	.8229512	9796	.3571077	0799	294	13	13.6	5.9	0.54	28547
14.0	.4115290	4953	.8196558	6846	.3556775	6500	294	43	47.6	39.8	0.50	28700
14.5	.4194717	4377	.8162965	3257	.3542195	1923	295	14	21.4	13.5	0.45	28856
15.0	.4273816	3474	.8128734	9030	.3527338	7069	295	44	55.1	47.2	0.39	29016
15.5	.4352580	2236	.8093869	4169	.3512206	1940	296	15	28.7	20.7	0.33	29180
16.0	.4431004	0658	.8058372	8676	.3496800	6537	296	45	62.2	54.1	0.27	29349
16.5	.4509082	8734	.8022247	2555	.3481122	0862	297	16	35.5	27.3	0.21	29521
17.0	.4586807	6457	.7985496	5808	.3465173	4916	297	47	8.6	0.3	0.14	29697
17.5	.4664170	3818	.7948123	8439	.3448953	8699	298	17	41.5	33.1	0.08	29878
18.0	.4741167	0813	.7910131	0451	.3432464	2214	298	48	14.1	5.6	—0.01	30063
18.5	.4817792	7436	.7871524	1848	.3415708	5461	299	18	46.5	37.9	+0.06	30253
19.0	.4894039	3681	.7832306	2634	.3398687	8444	299	49	18.7	10.0	0.12	30447
19.5	.4969901	9541	.7792481	2813	.3381402	1162	300	19	50.7	41.9	0.18	30645
20.0	.5045373	5012	.7752051	2388	.3363855	3619	300	50	22.3	13.5	0.24	30848
20.5	.5120450	0087	.7711020	1361	.3346048	5815	301	20	53.6	44.8	0.30	31056
21.0	.5195125	4761	.7669393	9738	.3327982	7753	301	51	24.7	15.8	0.35	31269
21.5	.5269394	9028	.7627173	7[illegible]22	.3309659	9434	302	21	55.7	46.6	0.39	31487
22.0	.5343251	2884	.7584363	4717	.3291081	0869	302	52	26.4	17.2	0.43	31710
22.5	.5416690	6321	.7540967	1325	.3272248	2030	303	22	56.7	47.4	0.46	31939
23.0	.5489706	9336	.7496989	7351	.3253163	2949	303	53	26.8	17.4	0.48	32174
23.5	.5562295	1924	.7452433	2800	.3233828	3618	304	23	56.6	47.1	0.50	32414
24.0	.5634450	4076	.7407303	7675	.3214244	4038	304	54	26.0	16.5	0.51	32660
24.5	.5706167	5794	.7361602	1978	.3194413	4211	305	24	55.2	45.5	0.51	32913
25.0	.5777440	7066	.7315333	5713	.3174335	4137	305	55	24.2	14.4	0.51	33171
25.5	.5848265	7890	.7268501	8886	.3154014	3820	306	25	52.8	43.0	0.50	33435
26.0	.5918636	8261	.7221110	1500	.3133451	3261	306	56	21.1	11.3	0.48	33706
26.5	.5988549	8173	.7173164	3558	.3112647	2461	307	26	49.2	39.3	0.45	33983
27.0	.6058000	7624	.7124665	5063	.3091694	1422	307	57	17.1	7.0	0.41	34267
27.5	.6126983	6606	.7075618	6021	.3070323	0145	308	27	44.7	34.4	0.37	34557
28.0	6195493	5116	.7026027	6435	.3048807	8633	308	58	11.9	1.6	0.33	34853
28.5	.6263526	3149	.6975895	6307	.3027056	6886	309	28	38.9	28.5	0.28	35156
29.0	.6331077	0700	.6925226	5642	.3005073	4907	309	58	65.7	55.2	0.22	35464
29.5	.6098141	7763	.6874024	4445	.2982858	2696	310	29	32.2	21.7	0.17	35779
30.0	.6464714	4336	.6822292	2718	.2960414	0257	310	59	58.4	47.9	0.10	36101
30.5	.6530790	0412	.6770035	0465	2937741	7588	311	30	24.4	13.8	+0.04	36429
31.0	.6596364	5986	.6717256	7690	.2914842	4693	312	0	50.2	39.5	—0.02	36763
31.5	+.6661431	1053	—.6663960	4399	—.2891718	1573	312	31	15.7	4.9	—0.08	37103

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. $0^d.0$.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
							° ′ ″	″	″	9.99
Feb. 1.0	+.6725987	5610	—.6610150	0594	—.2868371	8231	313 1 40.9	30.0	—0.14	37450
1.5	.6790028	:9651	.6555830	6278	.2844803	4667	313 31 65.9	54.9	0.21	37802
2.0	.6853550	3174	.6501004	1456	.2821016	0885	314 2 30.7	19.6	0.27	38160
2.5	.6916548	6172	.6445675	6132	.2797011	6884	314 32 55.3	44.1	0.33	38524
3.0	.6979016	8641	.6389847	:0309	.2772789	2667	315 3 19.6	8.4	0.38	38893
3.5	.7040948	0574	.6333525	3991	.2748353	8235	315 33 43.7	32.5	0.43	39267
4.0	.7102341	1968	.6276712	7182	.2723702	3589	316 3 67.6	56.3	0.48	39646
4.5	.7163189	2817	.6219413	9888	.2698841	8732	316 34 31.2	19.8	0.52	40031
5.0	.7223488	3117	.6161633	2113	.2673769	3665	317 4 54.6	43.1	0.56	40420
5.5	.7283233	2863	.6103375	3859	.2648491	8391	317 35 17.7	6.1	0.59	40813
6.0	.7342420	2051	.6044643	5131	.2623006	2911	318 5 40.6	28.9	0.61	41211
6.5	.7401043	0675	.5985442	5935	.2597318	7228	318 35 63.3	51.5	0.62	41613
7.0	.7459098	8732	.5925777	6275	.2571428	1343	319 6 25.7	13.9	0.62	42019
7.5	.7516580	6215	.5865653	6155	.2545338	5257	319 36 47.8	36.0	0.61	42429
8.0	.7573484	3121	.5805073	5579	.2519049	8973	320 6 69.7	57.8	0.59	42842
8.5	.7629805	9443	.5744043	4554	.2492565	2494	320 37 31.3	19.3	0.57	43259
9.0	.7685539	5179	.5682569	3085	.2465888	5822	321 7 52.5	40.5	0.55	43679
9.5	.7740680	0322	.5620654	1175	.2439020	8959	321 38 13.4	1.3	0.51	44102
10.0	.7795225	4869	.5558302	8827	.2411962	1906	322 8 34.1	21.9	0.47	44527
10.5	.7849169	8815	.5495520	6049	.2384717	4666	322 38 54.5	42.2	0.43	44956
11.0	.7902508	2156	.5432313	2846	.2357287	7241	323 9 14.5	2.1	0.38	45388
11.5	.7955236	4886	.5368685	9223	.2329675	9634	323 39 34.1	21.6	0.32	45823
12.0	.8007350	7002	.5304643	5185	.2301882	1846	324 9 53.4	40.9	0.26	46260
12.5	.8058848	8502	.5240191	0737	.2273911	3880	324 39 72.4	59.8	0.20	46690
13.0	.8109724	9381	.5175335	5885	.2245764	5738	325 10 31.1	18.4	0.13	47141
13.5	.8159975	9634	.5110080	0634	.2217444	7423	325 40 49.3	36.6	—0.07	47586
14.0	.8209596	9258	.5044431	4989	.2188953	8937	326 10 67.2	54.5	0.00	48033
14.5	.8258583	8247	.4978395	8957	.2160294	0283	326 41 24.7	11.9	+0.07	48482
15.0	.8306931	6598	.4911976	2542	.2131468	1462	327 11 41.7	28.0	0.14	48933
15.5	.8354638	4308	.4845181	5751	.2102479	2478	327 41 58.2	45.2	0.21	49387
16.0	.8401700	1373	.4778016	8590	.2073329	3333	328 12 14.3	1.2	0.27	49843
16.5	.8448116	7792	.4710485	1063	.2044022	4031	328 42 30.0	16.8	0.33	50303
17.0	.8493882	3561	.4642595	3177	.2014560	4574	329 12 45.4	32.0	0.38	50766
17.5	.8538993	8675	.4574350	4936	.1984945	4964	329 42 60.1	46.8	0.43	51231
18.0	.8583448	3133	.4505757	6347	.1955178	5202	330 13 14.4	1.1	0.48	51698
18.5	.8627244	6932	.4436821	7415	.1925263	5292	330 43 28.3	14.9	0.51	52169
19.0	.8670378	0070	.4367547	8145	.1895202	5236	331 13 41.7	28.3	0.54	52643
19.5	.8712846	2541	.4297943	8545	.1864998	5037	331 43 54.6	41.1	0.56	53121
20.0	.8754646	4345	.4228014	8620	.1834653	4697	332 13 67.1	53.5	0.58	53602
20.5	.8795775	5477	.4157766	8376	.1804170	4219	332 44 19.0	5.4	0.58	54085
21.0	.8836230	5936	.4087205	7818	.1773551	3608	333 14 30.4	16.7	0.58	54572
21.5	.8876010	5720	.4016336	6953	.1742799	2858	333 44 41.3	27.6	0.57	55063
22.0	.8915112	4826	.3945164	5784	.1711915	1979	334 14 51.8	38.0	0.55	55558
22.5	.8953534	3252	.3873694	4318	.1680903	0972	334 44 61.8	48.0	0.53	56056
23.0	.8991273	0995	.3801931	2558	.1649764	9838	335 14 71.3	57.4	0.50	56559
23.5	.9028328	8054	.3729881	:0512	.1618501	8580	335 45 20.3	6.3	0.46	57066
24.0	.9064696	4426	.3657550	8184	.1587117	7201	336 15 28.7	14.7	0.42	57577
24.5	.9100376	0110	.3584945	5583	.1555614	5703	336 45 36.8	22.7	0.37	58093
25.0	.9135365	5103	.3512069	2710	.1523994	4088	337 15 44.3	30.2	0.32	58613
25.5	.9169662	9404	.3438928	9573	.1492259	2358	337 45 51.4	37.2	0.26	59137
26.0	.9203264	3011	.3365529	6176	.1460411	0515	338 15 58.0	43.7	0.20	59665
26.5	.9236168	5919	.3291874	2525	.1428453	8562	338 45 64.1	49.8	0.14	60196
27.0	.9268374	8130	.3217971	8625	.1396387	6501	339 15 69.9	55.5	0.08	64734
27.5	.9299881	9641	.3143825	4482	.1364216	4335	339 46 15.2	0.8	+0.01	61276
28.0	.9330685	0450	.3069441	:0101	.1331942	2066	340 16 20.0	5.5	—0.05	61822
28.5	.9360783	0553	.2994826	5489	.1299567	9696	340 46 24.3	9.8	0.11	62372
Mar. 1.0	.9390173	:9948	.2919984	:0650	.1267094	7239	341 16 28.2	13.6	0.17	62925
1.5	.9418855	8635	.2844921	5590	.1234525	4665	241 46 31.7	17.0	0.23	63483
2.0	.9446825	6610	.2769642	:0314	.1201861	2006	342 16 34.7	19.9	0.29	64045
2.5	.9474083	3873	.2694151	4826	.1169106	9256	342 46 37.3	22.5	0.34	64611
3.0	+.9500626	0421	—.2618454	9131	—.1136261	6416	343 16 39.6	24.7	—0.39	65180

NOTE.—: denotes a change in the preceding figure.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ
Mar. 3.5	+.9526453	6253	−.2542556	3236	−.1103329	3489	343° 46′ 41″.4	26″.5	−0″.43	9.99 65753
4.0	.9551562	1367	.2466463	7145	.1070311	0476	344 16 42.8	27.8	0.47	66329
4.5	.9575952	5762	.2390180	0865	.1037211	7381	344 46 43.8	28.8	0.50	66909
5.0	.9599620	9436	.2313713	4400	.1004031	4208	345 16 44.5	29.4	0.52	67492
5.5	.9622564	2385	.2237069	7759	.0970773	0954	345 46 44.7	29.6	0.54	68077
6.0	.9644782	4609	.2160253	0945	.0937440	7626	346 16 44.5	29.3	0.55	68664
6.5	.9666273	6105	.2083272	3967	.0904035	4226	346 46 43.9	28.6	0.55	69255
7.0	.9687033	6871	.2006131	6828	.0870560	0756	347 16 42.8	27.5	0.54	69848
7.5	.9707062	6905	.1928835	9535	.0837015	7219	347 46 41.3	26.0	0.52	70443
8.0	.9726358	6207	.1851389	2091	.0803412	3619	348 16 39.4	24.0	0.49	71039
8.5	.9744919	4774	.1773800	4504	.0769743	9955	348 46 37.1	21.7	0.46	71637
9.0	.9762744	2605	.1696072	6778	.0736013	6230	349 16 34.5	19.0	0.42	72237
9.5	.9779832	9699	.1618212	8920	.0702224	2446	349 46 31.3	15.8	0.37	72837
10.0	.9796182	6055	.1540226	0936	.0668380	8607	350 16 27.7	12.2	0.32	73438
10.5	.9811792	1671	.1462122	2836	.0634484	4716	350 46 23.8	8.2	0.27	74041
11.0	.9826660	6545	.1383906	4620	.0600539	0776	351 16 19.5	3.8	0.21	74644
11.5	.9840785	0676	.1305584	6300	.0566548	6790	351 45 74.6	58.8	0.15	75248
12.0	.9854166	4063	.1227162	7880	.0532513	2760	352 15 69.3	53.4	0.09	75852
12.5	.9866803	6706	.1148645	9365	.0498438	8690	352 45 63.6	47.6	−0.02	76457
13.0	.9878694	8604	.1070040	0762	.0464325	4582	353 15 57.3	41.3	+0.05	77062
13.5	.9889839	9755	.0991353	2077	.0430177	0439	353 45 50.5	34.5	0.12	77666
14.0	.9900236	0159	.0912590	3315	.0395995	6262	354 15 43.3	27.2	0.19	78271
14.5	.9909885	9814	.0833758	4485	.0361784	2056	354 45 35.6	19.5	0.26	78876
15.0	.9918786	8722	.0754864	5592	.0327545	7822	355 15 27.4	11.2	0.32	79480
15.5	.9926939	6881	.0675914	6644	.0293282	3564	355 45 18.6	2.4	0.38	80084
16.0	.9934344	4293	.0596914	7645	.0258999	9286	356 14 69.3	53.0	0.44	80688
16.5	.9941000	0955	.0517871	8604	.0224697	4989	356 44 59.5	43.2	0.49	81292
17.0	.9946907	6869	.0438790	9524	.0190378	0674	357 14 49.2	32.8	0.54	81896
17.5	.9952066	2034	.0359678	:0413	.0156046	6347	357 44 38.3	21.9	0.58	82500
18.0	.9956476	6451	.0280540	1276	.0121704	2010	358 14 26.8	10.4	0.62	83104
18.5	.9960138	0120	.0201385	2122	.0087355	7666	358 43 74.8	58.3	0.64	83708
19.0	.9963052	3041	.0122218	2956	.0053000	3315	359 13 62.2	45.6	0.66	84312
19.5	.9965219	5215	−.0043045	3784	−.0018644	8964	359 43 49.0	32.4	0.67	84916
20.0	.9966639	6642	+.0036129	5389	+.0015713	5389	0 13 35.3	18.6	0.68	85521
20.5	.9967313	7323	.0115297	4556	.0050066	:9737	0 43 21.0	4.3	0.67	86126
21.0	.9967242	7259	.0194453	3711	.0084414	4081	1 12 66.2	49.4	0.66	86732
21.5	.9966427	6451	.0273590	2847	.0118753	8415	1 42 50.7	33.9	0.63	87339
22.0	.9964868	4899	.0352703	1959	.0153081	2739	2 12 34.7	17.8	0.60	87946
22.5	.9962567	2615	.0431785	1040	.0187395	7058	2 42 18.1	1.1	0.57	88554
23.0	.9959525	9571	.0510830	0085	.0221694	1343	3 11 60.7	43.8	0.53	89164
23.5	.9955742	5795	.0589833	9087	.0255974	5618	3 41 42.9	25.9	0.48	89775
24.0	.9951219	1279	.0668789	8043	.0290234	:9874	4 11 24.5	7.4	0.43	90387
24.5	.9945957	6024	.0747694	6947	.0324471	4106	4 40 65.5	48.4	0.38	91000
25.0	.9939957	:0032	.0826541	5794	.0358684	8315	5 10 46.0	28.8	0.32	91614
25.5	.9933220	3302	.0905324	4577	.0392868	2494	5 40 26.0	8.7	0.26	92229
26.0	.9925747	5837	.0984038	3291	.0427021	6643	6 9 65.4	48.0	0.20	92846
26.5	.9917540	7637	.1062677	1929	.0461141	0759	6 39 44.2	26.8	0.14	93465
27.0	.9908600	8705	.1141235	0487	.0495227	4841	7 9 22.3	5.0	+0.07	94085
27.5	.9898927	9039	.1219707	8959	.0529275	8885	7 38 60.1	42.6	0.00	94707
28.0	.9888523	8643	.1298088	7340	.0563284	2890	8 8 37.3	19.7	−0.06	95330
28.5	.9877390	7518	.1376374	5625	.0597252	6854	8 37 73.9	56.3	0.12	95955
29.0	.9865528	5664	.1454558	3809	.0631176	0774	9 7 50.0	32.4	0.17	96583
29.5	.9852939	3083	.1532635	1886	.0665053	4647	9 37 25.7	8.0	0.23	97212
30.0	.9839625	9776	.1610598	:9849	.0698881	8471	10 6 60.8	43.0	0.28	97842
30.5	.9825584	5743	.1688443	7694	.0732658	2244	10 36 35.4	17.6	0.32	98474
31.0	.9810818	0985	.1766166	5418	.0766383	5965	11 5 69.5	51.6	0.36	99107
31.5	.9795329	5504	.1843761	3013	.0800052	:9631	11 35 43.2	25.2	0.39	99741
Apr. 1.0	.9779120	9303	.1921222	0474	.0833664	3238	12 4 76.4	58.4	0.41	◆00376
1.5	.9762191	2382	.1998544	7796	.0867216	6786	12 34 49.1	31.1	0.42	01013
2.0	.9744542	4741	.2075722	4975	.0900706	0273	13 4 21.4	3.4	0.43	01651
2.5	+.9726175	6382	+.2152750	2003	+.0934130	3693	13 33 53.3	35.2	−0.43	02289

◆ The first figures of this and the following logarithms are 0.00.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ=☉'s True Longitude.	λ'	β=☉'s Latitude.	Log. Rad. Vect.=ρ.
Apr. 3.0	+.9707091	7306	+.2229622	8876	+.0967487	7047	14° 3′ 24″.7	6″.5	−0″.42	0.00 02926
3.5	.9687290	7513	.2306333	5587	.1000775	0331	14 32 55.6	37.4	0.41	03565
4.0	.9666773	7004	.2382878	2133	.1033991	3544	15 2 26.1	7.8	0.39	04203
4.5	.9645542	5781	.2459251	8506	.1067132	6681	15 31 56.2	37.8	0.36	04841
5.0	.9623600	3847	.2535445	4701	.1100197	;9743	16 1 25.9	7.4	0.32	05479
5.5	.9600948	1203	.2611455	0712	.1133183	2725	16 30 55.1	36.5	0.28	06116
6.0	.9577587	7851	.2687276	6534	.1166089	5628	17 0 23.8	5.2	0.23	06752
6.5	.9553519	3791	.2762902	2160	.1198910	8445	17 29 52.1	33.5	0.17	07387
7.0	.9528747	9028	.2838328	7587	.1231643	1175	17 59 20.0	1.4	0.11	08021
7.5	.9503272	3561	.2913548	2808	.1264288	3816	18 28 47.5	28.8	−0.05	08655
8.0	.9477095	7393	.2988556	7817	.1296840	6365	18 57 74.5	55.7	+0.01	09287
8.5	.9450217	0523	.3063347	2609	.1329298	8819	19 27 41.0	22.2	0.07	09916
9.0	.9422641	2956	.3137915	7178	.1361659	1177	19 56 67.1	48.2	0.14	10543
9.5	.9394370	4693	.3212255	1519	.1393921	3436	20 26 32.8	13.8	0.21	11170
10.0	.9365405	5737	.3286360	5626	.1426081	5593	20 55 58.0	38.9	0.28	11795
10.5	.9335748	6088	.3360224	;9491	.1458136	7645	21 25 22.7	3.6	0.35	12417
11.0	.9305402	5751	.3433842	3110	.1490084	;9590	21 54 47.0	27.8	0.42	13036
11.5	.9274370	4727	.3507209	6478	.1521923	1426	22 23 70.8	51.6	0.48	13653
12.0	.9242655	3021	.3580317	;9588	.1553650	3150	22 53 34.1	14.8	0.54	14267
12.5	.9210259	0633	.3653162	2434	.1585262	4759	23 22 56.9	37.6	0.59	14878
13.0	.9177185	7568	.3725736	5010	.1616757	6251	23 51 79.2	59.8	0.64	15486
13.5	.9143436	3828	.3798035	7311	.1648132	7623	24 21 41.0	21.6	0.68	16092
14.0	.9109014	9415	.3870055	;9333	.1679385	8873	24 50 62.3	42.8	0.71	16695
14.5	.9073923	4332	.3941790	1070	.1710514	;9999	25 20 23.0	3.5	0.74	17295
15.0	.9038166	8584	.4013234	2516	.1741516	0999	25 49 43.2	23.7	0.76	17893
15.5	.9001747	2173	.4084382	3666	.1772390	1870	26 18 63.0	43.4	0.77	18487
16.0	.8964668	5104	.4155229	4515	.1803134	2612	26 48 22.3	2.5	0.78	19078
16.5	.8926932	7377	.4225769	5057	.1833744	3219	27 17 41.0	21.1	0.78	19667
17.0	.8888543	8997	.4295997	5287	.1864218	3691	27 46 59.1	39.2	0.77	20254
17.5	.8849505	9968	.4365908	5200	.1894554	4024	28 15 76.7	56.8	0.75	20838
18.0	.8809821	;0293	.4435498	4792	.1924750	4218	28 45 33.8	23.8	0.73	21418
18.5	.8769495	9976	.4504761	4057	.1954803	4268	29 14 50.3	30.2	0.70	21998
19.0	.8728531	9021	.4573691	2989	.1984712	4175	29 43 66.3	46.1	0.66	22575
19.5	.8686933	7431	.4642284	1584	.2014474	3935	30 13 21.8	1.5	0.62	23149
20.0	.8644704	5211	.4710536	;9839	.2044088	3547	30 42 36.6	16.3	0.57	23721
20.5	.8601849	2365	.4778443	7748	.2073552	3009	31 11 50.9	30.5	0.52	24292
21.0	.8558371	8896	.4845999	5307	.2102863	2318	31 40 64.7	44.2	0.46	24861
21.5	.8514274	4808	.4913200	2510	.2132020	1473	32 9 77.9	57.4	0.40	25428
22.0	.8469561	;0104	.4980042	;9355	.2161021	0472	32 39 30.6	10.0	0.34	25994
22.5	.8424237	4789	.5046520	5835	.2189865	9314	33 8 42.8	22.2	0.28	26559
23.0	.8378304	8865	.5112630	1948	.2218549	7996	33 37 54.5	33.8	0.21	27122
23.5	.8331765	2335	.5178368	7689	.2247071	6516	34 6 65.6	44.8	0.14	27684
24.0	.8284625	5204	.5243729	3053	.2275429	4873	34 35 76.2	55.3	0.08	28245
24.5	.8236888	7476	.5308709	8036	.2303623	3065	35 5 26.4	5.4	+0.02	28805
25.0	.8188557	9154	.5373305	2635	.2331650	1090	35 34 36.1	15.0	−0.04	29363
25.5	.8139636	;0242	.5437512	6845	.2359508	8946	36 3 45.2	24.1	0.09	29921
26.0	.8090129	0745	.5501326	0663	.2387196	6633	36 32 53.8	32.6	0.14	30478
26.5	.8040041	0666	.5564742	4082	.2414712	4147	37 1 62.0	40.8	0.18	31034
27.0	.7989374	;0008	.5627757	7101	.2442054	1488	37 30 69.8	48.5	0.22	31589
27.5	.7938133	8776	.5690366	;9713	.2469221	8654	37 59 77.1	55.8	0.25	32143
28.0	.7886321	6974	.5752565	1916	.2496210	5642	38 29 24.0	2.6	0.29	32695
28.5	.7833941	4603	.5814351	3705	.2523019	2449	38 58 30.4	8.9	0.31	33246
29.0	.7780996	1667	.5875719	5077	.2549648	9077	39 27 36.4	14.8	0.33	33797
29.5	.7727491	8171	.5936666	6028	.2576094	5522	39 56 42.0	20.3	0.33	34347
30.0	.7673429	4119	.5997188	6554	.2602356	1783	40 25 47.1	25.4	0.33	34896
30.5	.7618813	9512	.6057281	6651	.2628432	7858	40 54 51.9	30.1	0.31	35443
May 1.0	.7563648	4356	.6116940	6314	.2654320	3745	41 23 56.3	34.4	0.29	35989
1.5	.7507937	8654	.6176161	5539	.2680019	;9443	41 52 60.3	38.4	0.27	36533
2.0	.7451685	2412	.6234939	4321	.2705526	4950	42 21 64.0	42.0	0.24	37075
2.5	.7394896	5632	.6293272	2658	.2730840	0263	42 50 67.3	45.3	0.20	37614
3.0	+.7337574	8319	+.6351155	0545	+.2755959	5381	43 19 70.2	48.1	−0.15	38152

NOTE.—; denotes a change in the preceding figure.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ=☉'s True Longitude.	λ′	β=☉'s Latitude.	Log. Rad. Vect.=ρ.
May 3.5	+.7279721	:0475	+.6408584	7978	+.2780881	0302	43° 48′ 72.7″	50.5″	—0.10″	0.00 38688
4.0	.7221342	2106	.6465555	4953	.2805604	5025	44 17 75.0	52.7	—0.05	39221
4.5	.7162441	3214	.6522063	1465	.2830127	:9548	44 46 76.9	54.5	+0.01	39751
5.0	.7103021	3803	.6578105	7511	.2854448	3868	45 15 78.4	55.9	0.07	40279
5.5	.7043087	3878	.6633675	3085	.2878565	7985	45 44 79.6	57.1	0.13	40804
6.0	.6982642	3443	.6688770	8185	.2902475	1895	46 13 80.5	57.9	0.20	41325
6.5	.6921691	2501	.6743386	2805	.2926178	5598	46 42 81.0	58.4	0.26	41842
7.0	.6860238	1057	.6797518	6942	.2949671	9090	47 11 81.2	58.5	0.33	42355
7.5	6798287	9115	.6851163	0592	.2972952	2371	47 40 81.1	58.3	0.40	42865
8.0	.6735845	6683	.6904316	3750	.2996020	5439	48 9 80.7	57.8	0.46	43371
8.5	.6672916	3763	.6956974	6413	.3018873	8292	48 38 79.9	56.9	0.52	43873
9.0	.6609504	:0360	.7009132	8576	.3041509	0928	49 7 78.7	55.6	0.58	44370
9.5	.6545614	6479	.7060787	0236	.3063926	3345	49 36 77.2	54.0	0.63	44863
10.0	.6481252	2127	.7111934	1388	.3086122	5542	50 5 75.4	52.1	0.68	45351
10.5	.6416422	7306	.7162569	2028	.3108095	7515	50 34 73.1	49.8	0.73	45834
11.0	.6351128	2021	.7212689	2154	.3129844	9264	51 3 70.4	47.1	0.77	46312
11.5	.6285376	6278	.7262290	1760	.3151369	0789	51 32 67.5	44.1	0.80	46786
12.0	.6219170	:0082	.7311368	0844	.3172667	2088	52 1 64.3	40.8	0.82	47255
12.5	.6152516	3437	.7359920	9401	.3193736	3157	52 30 60.6	37.0	0.84	47718
13.0	.6085419	6349	.7407941	7428	.3214574	3996	52 59 56.5	32.8	0.85	48177
13.5	.6017884	8823	.7455429	4922	.3235180	4603	53 28 52.1	28.3	0.85	48631
14.0	.5949917	:0866	.7502380	1879	.3255553	4977	53 57 47.3	23.4	0.84	49079
14.5	.5881523	2481	.7548791	8295	.3275691	5115	54 26 42.1	18.1	0.82	49522
15.0	.5812709	3676	.7594659	4169	.3295593	5018	54 55 36.5	12.4	0.79	49960
15.5	.5743480	4456	.7639981	9497	.3315258	4684	55 24 30.5	6.4	0.76	50393
16.0	.5673841	4826	.7684754	4276	.3334683	4110	55 52 84.1	59.9	0.73	50822
16.5	.5603798	4792	.7728975	8503	.3353868	3296	56 21 77.3	53.1	0.69	51246
17.0	.5533356	4359	.7772640	2174	.3372813	2242	56 50 70.1	45.8	0.64	51666
17.5	.5462521	3533	.7815747	5287	.3391516	0946	57 19 61.5	38.1	0.60	52081
18.0	.5391297	2318	.7858293	7839	.3409975	9406	57 48 54.5	30.0	0.53	52491
18.5	.5319690	:0720	.7900275	:9827	.3428189	7622	58 17 46.1	21.5	0.47	52898
19.0	.5247708	8747	.7941690	1249	.3446157	5591	58 46 37.3	12.6	0.41	53300
19.5	.5175356	6404	.7982537	2102	.3463878	3313	59 15 28.1	3.3	0.35	53698
20.0	.5102639	3696	.8022813	2385	.3481352	0789	59 43 78.4	53.5	0.28	54092
20.5	.5029562	:0628	.8062516	2395	.3498577	8015	60 12 68.4	43.4	0.22	54482
21.0	.4956131	7206	.8101643	1229	.3515551	4991	60 41 58.0	32.9	0.15	54869
21.5	.4882351	3435	.8140193	:9786	.3532274	1715	61 10 47.2	22.0	0.09	55252
22.0	.4808226	9318	.8178163	7763	.3548746	8189	61 39 36.0	10.7	+0.03	55631
22.5	.4733763	4864	.8215551	5158	.3564965	4409	62 7 84.5	59.1	—0.03	56007
23.0	.4658968	:0079	.8252355	1969	.3580931	0377	62 36 72.7	47.2	0.08	56381
23.5	.4583845	4964	.8288573	8194	.3596644	6092	63 5 60.4	34.8	0.13	56752
24.0	.4508398	9525	.8324203	3832	.3612102	1552	63 34 47.7	22.1	0.18	57119
24.5	.4432634	3770	.8359243	8879	.3627305	6757	64 3 34.8	9.1	0.22	57483
25.0	.4356558	7703	.8393691	3335	.3642251	1705	64 31 81.6	55.8	0.25	57845
25.5	.4280175	1329	.8427544	7195	.3656939	6395	65 0 68.0	42.1	0.27	58204
26.0	.4203491	4653	.8460800	0459	.3671369	0827	65 29 54.1	28.1	0.29	58559
26.5	.4126510	7681	.8493459	3125	.3685540	5000	65 58 39.9	13.8	0.29	58912
27.0	.4049238	:0417	.8525517	5191	.3699450	8912	66 26 85.5	59.3	0.29	59262
27.5	.3971680	2868	.8556974	6656	.3713099	2563	66 55 70.8	44.5	0.28	59610
28.0	.3893842	5038	.8587827	7517	.3726487	5954	67 24 55.7	29.4	0.27	59955
28.5	.3815728	6933	.8618073	7771	.3739612	9081	67 53 40.5	14.0	0.25	60296
29.0	.3737344	8557	.8647711	7417	.3752474	1946	68 21 85.0	58.4	0.22	60635
29.5	.3658694	9915	.8676739	6453	.3765072	4546	68 50 69.3	42.6	0.19	60971
30.0	.3579783	:1012	.8705155	4877	.3777405	6882	69 19 53.4	26.7	0.15	61304
30.5	.3500616	1853	.8732958	2688	.3789472	8951	69 48 37.3	10.5	0.10	61633
31.0	.3421199	2444	.8760145	:9883	.3801272	0754	70 16 80.9	54.0	—0.04	61959
31.5	.3341538	2791	.8786714	6460	.3812805	2289	70 45 64.4	37.4	+0.02	62282
June 1.0	.3261637	2898	.8812664	2419	.3824067	3555	71 14 47.7	20.6	0.08	62601
1.5	.3181502	2771	.8837992	7755	.3835061	4552	71 43 30.8	3.6	0.14	62916
2.0	.3101139	2416	.8862696	2468	.3845784	5278	72 11 73.7	46.4	0.20	63228
2.5	+.3020554	1839	+.8886775	6556	+.3856235	5732	72 40 56.5	29.1	+0.27	63535

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. $0^d.0$.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X'.	Y.	Y'.	Z.	Z'.	λ=☉'s True Longitude.	λ'	β=☉'s Latitude.	Log. Rad. Vect.=ρ.
							° ′ ″	″	″	0.00
June 3.0	+.2939752	:1044	+.8910226	0016	+.3866413	5913	73 9 39.1	11.6	+0.33	63837
3.5	.2858738	:0038	.8933047	2846	.3876318	5821	73 37 81.5	54.0	0.40	64135
4.0	.2777518	8826	.8955237	5045	.3885950	5456	74 6 63.8	36.2	0.46	64428
4.5	.2696098	7414	.8976794	6611	.3895307	4816	74 35 45.9	18.2	0.52	64717
5.0	.2614483	5806	.8997716	7542	.3904389	3902	75 4 29.9	0.1	0.58	65001
5.5	.2532678	4009	.9018001	7836	.3913194	2710	75 32 69.8	41.9	0.63	65279
6.0	.2450690	2028	.9037647	7492	.3921722	1242	76 1 51.5	23.5	0.68	65552
6.5	.2368525	9871	.9056653	6507	.3929971	9494	76 30 33.0	4.9	0.73	65820
7.0	.2286188	7541	.9075017	4881	.3937941	7468	76 58 74.4	46.2	0.77	66082
7.5	.2203687	5047	.9092738	2612	.3945632	5162	77 27 55.6	27.3	0.80	66338
8.0	.2121026	2393	.9109814	9698	.3953043	2577	77 56 36.7	8.3	0.83	66588
8.5	.2038213	9587	.9126244	6138	.3960173	:9711	78 24 77.7	49.2	0.84	66832
9.0	.1955254	6635	.9142025	1928	.3967021	6563	78 53 58.5	29.9	0.85	67070
9.5	.1872155	3543	.9157158	7071	.3973587	3133	79 22 39.1	10.4	0.85	67301
10.0	.1788922	:0317	.9171639	1562	.3979871	9421	79 50 79.6	50.8	0.84	67526
10.5	.1705561	6963	.9185470	5403	.3985872	5426	80 19 60.0	31.1	0.83	67745
11.0	.1622078	3486	.9198649	8593	.3991589	1147	80 48 40.1	11.1	0.81	67958
11.5	.1538480	9895	.9211175	1129	.3997023	6585	81 16 80.0	50.9	0.78	68165
12.0	.1454775	6196	.9223047	3011	.4002172	1738	81 45 59.8	30.6	0.74	68365
12.5	.1370968	2396	.9234265	4239	.4007037	6607	82 14 39.4	10.1	0.70	68558
13.0	.1287065	8499	.9244828	4813	.4011617	1191	82 42 78.9	49.5	0.65	68745
13.5	.1203072	4512	.9254735	4730	.4015912	5490	83 11 58.1	28.7	0.60	68926
14.0	.1118996	:0442	.9263985	3991	.4019923	9506	83 40 37.2	7.7	0.54	69101
14.5	.1034843	6295	.9272580	2596	.4023649	3236	84 8 76.1	46.5	0.48	69270
15.0	.0950621	2079	.9280518	0545	.4027091	6683	84 37 54.7	25.0	0.42	69433
15.5	.0866335	7799	.9287799	7837	.4030247	:9843	85 6 33.2	3.4	0.36	69591
16.0	.0781992	3462	.9294423	4472	.4033119	2720	85 34 71.5	41.6	0.29	69743
16.5	.0697598	9074	.9300389	0449	.4035705	5310	86 3 49.6	19.6	0.23	69889
17.0	.0613159	4640	.9305698	5769	.4038005	7615	86 31 87.4	57.3	0.16	70029
17.5	.0528680	:0167	.9310349	0431	.4040020	:9635	87 0 65.1	34.9	0.10	70164
18.0	.0444168	5660	.9314344	4437	.4041750	1370	87 29 42.6	12.3	+0.03	70294
18.5	.0359628	:1125	.9317684	7788	.4043195	2820	87 57 79.9	49.5	−0.03	70418
19.0	.0275066	6568	.9320367	0483	.4044356	3986	88 26 57.1	26.6	0.09	70538
19.5	.0190488	1995	.9322394	2521	.4045233	4868	88 55 34.1	3.5	0.14	70654
20.0	.0105901	7413	.9323765	3904	.4045825	5465	89 23 70.9	40.2	0.19	70763
20.5	+.0021310	2827	.9324480	4630	.4046134	5779	89 52 47.5	16.7	0.23	70871
21.0	−.0063280	1758	.9324540	4702	.4046158	5808	90 20 84.1	53.2	0.27	70973
21.5	.0147863	6336	.9323946	4120	.4045899	5554	90 49 60.5	29.5	0.29	71071
22.0	.0232432	0901	.9322697	2883	.4045356	5016	91 18 36.8	5.7	0.31	71165
22.5	.0316983	5447	.9320795	0993	.4044530	4195	91 46 72.9	41.7	0.32	71256
23.0	.0401509	:9969	.9318240	8450	.4043420	3091	92 15 48.9	17.7	0.33	71343
23.5	.0486006	4461	.9315032	5254	.4042028	1704	92 43 84.9	53.6	0.32	71427
24.0	.0570466	:8917	.9311172	1406	.4040353	0035	93 12 60.7	29.3	0.31	71507
24.5	.0654885	3332	.9306659	6905	.4038395	8082	93 41 36.4	4.9	0.29	71582
25.0	.0739257	7700	.9301494	1752	.4036155	5848	94 9 72.0	40.4	0.27	71653
25.5	.0823577	2016	.9295677	5947	.4033632	3330	94 38 47.6	15.9	0.24	71721
26.0	.0907840	6276	.9289208	9490	.4030828	0532	95 6 83.1	51.3	0.20	71786
26.5	.0992040	0472	.9282090	2384	.4027742	7451	95 35 58.6	26.7	0.16	71847
27.0	.1076171	4600	.9274324	4631	.4024374	4089	96 4 34.1	2.1	0.11	71904
27.5	.1160228	:8653	.9265907	6226	.4020724	0444	96 32 69.6	37.5	−0.06	71959
28.0	.1244205	2627	.9256839	7170	.4016792	6518	97 1 45.0	12.8	0.00	72009
28.5	.1328096	6515	.9247123	7466	.4012580	2311	97 29 80.4	48.1	+0.06	72055
29.0	.1411897	0313	.9236760	7116	.4008086	7824	97 58 55.8	23.4	0.12	72098
29.5	.1495601	4014	.9225750	6118	.4003311	3054	98 26 91.3	58.8	0.18	72136
30.0	.1579203	7614	.9214092	4473	.3998255	8005	98 55 66.8	34.2	0.24	72170
30.5	.1662698	1106	.9201786	2180	.3992918	2673	99 24 42.4	9.7	0.30	72200
July 1.0	.1746081	4487	.9188833	9240	.3987301	7063	99 52 78.0	45.2	0.36	72226
1.5	.1829346	7750	.9175235	5655	.3981403	1171	100 21 53.7	20.8	0.42	72246
2.0	.1912486	0888	.9160991	1423	.3975226	5000	100 49 89.4	56.4	0.48	72262
2.5	.1995495	3895	.9146102	6547	.3968769	8549	101 18 65.2	32.1	0.54	72274
3.0	−.2078368	6766	+.9130569	1027	+.3962032	1818	101 47 41.1	7.9	+0.60	72281

NOTE.—: denotes a change in the preceding figure.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
July 3.5	−.2161098	:9494	+.9114393	4864	+.3955016	4808	102° 15′ 77″.1	43″.8	+0″.65	0.00 72281
4.0	.2243679	2074	.9097573	8057	.3947720	7518	102 44 53.1	19.7	0.69	72276
4.5	.2326105	4499	.9080112	0609	.3940145	:9949	103 12 89.2	55.7	0.72	72266
5.0	.2408371	6764	.9062011	2521	.3932291	2102	103 41 65.5	31.9	0.75	72251
5.5	.2490470	:8862	.9043270	3793	.3924159	3976	104 10 41.8	8.1	0.76	72230
6.0	.2572397	0788	.9023890	4426	.3915750	5574	104 38 78.1	44.3	0.77	72202
6.5	.2654146	2536	.9003872	4421	.3907064	6894	105 7 54.6	20.7	0.77	72168
7.0	.2735711	4100	.8983217	3779	.3898101	7938	105 35 91.2	57.2	0.77	72129
7.5	.2817085	5473	.8961926	2501	.3888862	8705	106 4 67.8	33.7	0.75	72084
8.0	.2898261	6649	.8940000	0588	.3879347	9197	106 33 44.5	10.3	0.73	72032
8.5	.2979234	7621	.8917441	8042	.3869558	9415	107 1 81.3	47.1	0.71	71973
9.0	.3059998	8385	.8894250	4865	.3859494	9358	107 30 58.2	23.9	0.68	71908
9.5	.3140545	:8932	.8870430	1058	.3849156	9027	107 59 35.1	0.7	0.64	71836
10.0	.3220870	:9257	.8845981	6622	.3838544	8421	108 27 72.1	37.6	0.59	71758
10.5	.3300966	:9353	.8820906	1560	.3827659	7543	108 56 49.2	14.6	0.54	71673
11.0	.3380828	:9216	.8795206	5874	.3816503	6394	109 24 86.4	51.7	0.49	71581
11.5	.3460450	:8839	.8768884	9565	.3805078	4976	109 53 63.6	28.8	0.43	71483
12.0	.3539826	8216	.8741941	2635	.3793384	3288	110 22 40.8	5.9	0.37	71379
12.5	.3618949	7340	.8714380	5087	.3781422	1333	110 50 78.1	43.1	0.31	71267
13.0	.3697814	6206	.8686203	6924	.3769192	9110	111 19 55.5	20.4	0.24	71148
13.5	.3776416	4809	.8657413	8147	.3756696	6621	111 47 92.9	57.7	0.18	71024
14.0	.3854748	3142	.8628011	8759	.3743934	3866	112 16 70.3	35.1	0.11	70894
14.5	.3932805	1200	.8598000	8761	.3730908	0847	112 45 47.8	12.5	+0.04	70758
15.0	.4010580	:8977	.8567382	8157	.3717619	7565	113 13 85.4	50.0	−0.02	70615
15.5	.4088069	6468	.8536160	6948	.3704068	4021	113 42 63.0	27.5	0.08	70467
16.0	.4165266	3667	.8504335	5136	.3690255	0215	114 11 40.6	5.0	0.14	70314
16.5	.4242165	0568	.8471911	2725	.3676182	6149	114 39 78.2	42.5	0.19	70155
17.0	.4318761	7166	.8438890	9718	.3661850	1824	115 8 56.0	20.2	0.24	69990
17.5	.4395050	3457	.8405276	6117	.3647261	7242	115 36 93.8	57.9	0.28	69821
18.0	.4471025	:9435	.8371071	1926	.3632416	2404	116 5 71.6	35.6	0.32	69647
18.5	.4546682	5094	.8336279	7147	.3617317	7312	116 34 49.5	13.4	0.35	69468
19.0	.4622015	0430	.8300901	1783	.3601965	1968	117 2 87.4	51.3	0.38	69285
19.5	.4697019	5437	.8264940	5835	.3586361	6371	117 31 65.4	29.2	0.40	69097
20.0	.4771689	0111	.8228399	9308	.3570507	0524	118 0 43.5	7.2	0.41	68905
20.5	.4846020	4445	.8191282	2204	.3554402	4426	118 28 81.7	45.3	0.41	68709
21.0	.4920008	:8437	.8153591	4526	.3538048	8080	118 57 59.9	23.4	0.40	68509
21.5	.4993647	2079	.8115328	6276	.3521445	1484	119 26 38.2	1.6	0.38	68306
22.0	.5066933	5369	.8076496	7458	.3504596	4642	119 54 76.7	40.0	0.36	68099
22.5	.5139862	8302	.8037095	8070	.3487501	7554	120 23 55.3	18.5	0.33	67887
23.0	.5212429	0873	.7997130	8118	.3470161	0222	120 51 94.1	57.2	0.30	67672
23.5	.5284629	3077	.7956603	7604	.3452578	2646	121 20 73.0	36.0	0.25	67453
24.0	.5356456	4909	.7915517	6532	.3434752	4827	121 49 52.0	15.0	0.20	67231
24.5	.5427905	6362	.7873874	4902	.3416686	6768	122 17 91.2	54.1	0.15	67005
25.0	.5498972	7434	.7831678	2719	.3398380	8470	122 46 70.6	33.4	0.10	66776
25.5	.5569654	8121	.7788934	9988	.3379835	9932	123 15 50.2	12.9	−0.04	66544
26.0	.5639946	8418	.7745643	6710	.3361052	1157	123 43 90.0	52.6	+0.02	66308
26.5	.5709843	8320	.7701809	2889	.3342034	2146	124 12 69.9	32.4	0.08	66069
27.0	.5779339	7821	.7657433	8526	.3322781	2901	124 41 50.0	12.4	0.14	65828
27.5	.5848428	6916	.7612517	3623	.3303294	3421	125 9 90.4	52.7	0.21	65583
28.0	.5917106	5600	.7567064	8183	.3283575	3710	125 38 71.0	33.3	0.27	65334
28.5	.5985370	3870	.7521078	2210	.3263624	3766	126 7 51.9	14.1	0.33	65082
29.0	.6053216	1722	.7474559	5704	.3243442	3591	126 35 93.0	55.2	0.39	64827
29.5	.6120638	:9150	.7427512	8670	.3223030	3186	127 4 74.4	36.5	0.45	64567
30.0	.6187631	6150	.7379939	:1110	.3202390	2554	127 33 56.0	18.1	0.50	64304
30.5	.6254190	2715	.7331844	3028	.3181522	1693	128 2 38.0	0.0	0.55	64037
31.0	.6320311	:8843	.7283229	4425	.3160428	0607	128 30 80.3	42.1	0.59	63766
31.5	.6385988	4527	.7234097	5306	.3139110	9296	128 59 62.9	24.6	0.63	63491
Aug. 1.0	.6451217	:9763	.7184450	5672	.3117569	7763	129 28 45.8	7.4	0.66	63211
1.5	.6515992	4545	.7134293	5528	.3095806	6007	129 56 88.9	50.4	0.68	62927
2.0	.6580309	:8870	.7083627	4874	.3073823	4032	130 25 72.3	33.8	0.70	62639
2.5	−.6644162	2730	+.7032457	3717	+.3051620	1836	130 54 56.1	17.5	+0.70	62346

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. $0^d.0$.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
Aug. 3.0	—.6707546	6122	+.6980787	2059	+.3029199	9423	131° 23′ 40″.2	1″.6	+0″.70	0.00 62047
3.5	.6770456	:9039	.6928618	9903	.3006561	6793	131 51 84.6	45.9	0.69	61744
4.0	.6832887	1478	.6875954	7250	.2983708	3948	132 20 69.3	30.5	0.68	61436
4.5	.6894834	3433	.6822799	4098	.2960641	0889	132 49 54.3	15.4	0.65	61121
5.0	.6956292	4899	.6769156	:0477	.2937363	7618	133 18 39.6	0.6	0.62	60801
5.5	.7017257	5872	.6715029	6362	.2913874	4137	133 46 85.3	46.2	0.58	60476
6.0	.7077724	6348	.6660422	1767	.2890177	0447	134 15 71.3	32.1	0.54	60145
6.5	.7137688	6321	.6605340	6697	.2866273	6551	134 44 57.6	18.4	0.50	59809
7.0	.7197144	5786	.6549785	:1154	.2842164	2449	135 13 44.2	4.9	0.43	59467
7.5	.7256087	4738	.6493763	5144	.2817852	8145	135 41 91.0	51.6	0.37	59120
8.0	.7314512	3172	.6437277	8669	.2793338	3639	136 10 78.1	38.7	0.31	58767
8.5	.7372414	1083	.6380331	1735	.2768624	8933	136 39 65.6	26.1	0.25	58409
9.0	.7429788	8467	.6322924	4345	.2743712	4028	137 8 53.3	13.7	0.18	58045
9.5	.7486631	5320	.6265075	6503	.2718604	8928	137 37 41.3	1.6	0.12	57675
10.0	.7542939	1638	.6206773	8212	.2693302	3633	138 5 89.6	49.8	+0.05	57298
10.5	.7598707	7416	.6148028	9479	.2667807	8146	138 34 78.2	38.4	—0.02	56916
11.0	.7653930	2649	.6088843	:0305	.2642122	2468	139 3 67.1	27.2	0.09	56529
11.5	.7708605	7334	.6029225	:0699	.2616248	6602	139 32 56.2	16.2	0.15	56136
12.0	.7762727	1466	5969178	:0662	.2590189	0551	140 1 45.6	5.6	0.21	55738
12.5	.7816292	5041	.5908706	:0201	.2563945	4315	140 29 95.3	55.3	0.27	55335
13.0	.7869297	8057	.5847813	9319	.2537519	7896	140 58 85.3	45.2	0.32	54926
13.5	.7921738	0509	.5786504	8021	.2510913	1298	141 27 75.5	35.3	0.37	54513
14.0	.7973611	2393	.5724784	6312	.2484129	4521	141 56 65.9	25.6	0.41	54095
14.5	.8024913	3706	.5662658	4197	.2457169	7569	142 25 56.6	16.2	0.44	53673
15.0	.8075639	4443	.5600129	1678	.2430035	0442	142 54 47.6	7.1	0.47	53247
15.5	.8125786	4591	.5537203	8763	.2402729	3143	143 22 98.8	58.2	0.49	52816
16.0	8175350	4177	.5473886	5456	.2375253	5674	143 51 90.3	49.6	0.50	52381
16.5	.8224327	3166	.5410182	1764	.2347610	8039	144 20 82.0	41.3	0.50	51942
17.0	.8272715	1566	.5346095	7686	.2319800	:0236	144 49 74.0	33.3	0.50	51500
17.5	.8320511	:9374	.5281628	3229	.2291827	2270	145 18 66.3	25.5	0.49	51054
18.0	.8367712	6587	.5216787	8398	.2263692	4142	145 47 58.9	18.1	0.47	50605
18.5	.8414314	3201	.5151579	3210	.2235398	5855	146 16 51.8	10.9	0.46	50153
19.0	.8460315	9214	.5086006	7637	.2206945	7409	146 45 45.0	4.0	0.41	49698
19.5	.8505712	4623	.5020073	1714	.2178336	8807	147 13 98.4	57.3	0.38	49240
20.0	.8550502	:9426	.4953784	5434	.2149574	:0052	147 42 92.1	50.9	0.34	48779
20.5	.8594682	3619	.4887144	8804	.2120660	1145	148 11 86.2	44.9	0.29	48316
21.0	.8638248	7198	.4820156	1825	.2091596	2088	148 40 80.7	39.3	0.23	47851
21.5	.8681198	0161	.4752828	4506	.2062383	2882	149 9 75.4	34.0	0.18	47383
22.0	.8723530	2506	.4685161	6848	.2033025	3531	149 38 70.4	29.0	0.12	46913
22.5	.8765240	4229	.4617163	8859	.2003522	4035	150 7 65.9	24.4	—0.06	46441
23.0	.8806324	5327	.4548837	:0542	.1973876	4396	150 36 61.7	20.1	0.00	45968
23.5	.8846782	5798	.4480188	1902	.1944090	4617	151 5 57.8	16.2	+0.06	45493
24.0	.8886610	5640	.4411219	2942	.1914165	4700	151 34 56.4	12.8	0.13	45016
24.5	.8925804	4848	.4341936	3668	.1884104	4646	152 3 51.4	9.7	0.20	44537
25.0	.8964361	3419	.4272341	4081	.1853908	4457	152 32 48.7	7.0	0.26	44056
25.5	.9002279	1351	.4202440	4188	.1823579	4135	153 1 46.4	4.7	0.32	43573
26.0	.9039554	8640	.4132237	3993	.1793118	3680	153 30 44.6	2.8	0.37	43088
26.5	.9076184	5284	.4061736	3500	.1762528	3097	153 59 43.3	1.4	0.41	42601
27.0	.9112165	1279	.3990942	2714	.1731811	2387	154 28 42.4	0.5	0.45	42112
27.5	.9147495	6623	.3919861	:1641	.1700970	1553	154 57 41.9	0.0	0.48	41621
28.0	.9182171	1314	.3848496	:0284	.1670005	0595	155 25 101.8	59.8	0.52	41128
28.5	.9216190	5348	.3776854	8650	.1638920	9517	155 55 42.2	0.1	0.55	40632
29.0	.9249548	8721	.3704938	6741	.1607714	8317	156 24 43.1	0.9	0.57	40134
29.5	.9282244	1432	.3632754	4565	.1576392	7002	156 53 44.4	2.2	0.58	39634
30.0	.9314276	3479	.3560305	2123	.1544954	5570	157 22 46.3	4.0	0.58	39131
30.5	.9345639	4857	.3487597	9422	.1513404	4027	157 51 48.7	6.3	0.57	38626
31.0	.9376331	5564	.3414633	6465	.1481742	2371	158 20 51.5	9.1	0.56	38118
31.5	.9406349	5599	.3341419	3258	.1449972	:0608	158 49 54.8	12.4	0.53	37606
Sept. 1.0	.9435689	4953	.3267961	9807	.1418095	8737	159 18 58.7	16.2	0.51	37091
1.5	.9464349	3628	.3194264	6117	.1386115	6764	159 47 63.0	20.4	0.47	36572
2.0	—.9492325	1620	+.3120333	2192	+.1354032	4687	160 16 67.8	25.1	+0.43	36050

NOTE.—: denotes a change in the preceding figure.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
										0.99
Sept. 2.5	−.9519615	8926	+.3046173	8039	+.1321850	2511	160° 45′ 73″.1	30″.4	+0″.38	35526
3.0	.9546217	5544	.2971791	3663	.1289570	:0237	161 14 78.9	36.1	0.33	34999
3.5	.9572128	1471	.2897191	9069	.1257196	7869	161 43 85.2	42.4	0.27	34467
4.0	.9597346	6705	.2822378	4262	.1224729	5409	162 12 92.0	49.1	0.21	33931
4.5	.9621868	1243	.2747359	9249	.1192172	2858	162 41 99.2	56.3	0.15	33392
5.0	.9645691	5082	.2672140	4036	.1159527	:0219	163 11 46.9	4.0	0.08	32849
5.5	.9668814	8221	.2596725	8627	.1126798	7496	163 40 55.1	12.1	+0.02	32301
6.0	.9691234	0658	.2521119	3026	.1093987	4691	164 9 63.7	20.6	−0.06	31750
6.5	.9712949	2389	.2445329	7241	.1061097	1807	164 38 72.8	29.6	0.13	31195
7.0	.9733958	3415	.2369361	:1278	.1028129	8845	165 7 82.4	39.1	0.19	30637
7.5	.9754257	3731	.2293221	5143	.0995086	5808	165 36 92.4	49.1	0.26	30075
8.0	.9773846	3337	.2216914	8841	.0961969	2697	166 5 102.9	59.5	0.32	29509
8.5	.9792722	2230	.2140445	2377	.0928784	9518	166 35 53.8	10.4	0.38	28938
9.0	.9810884	0409	.2063820	5757	.0895532	6271	167 4 65.2	21.7	0.43	28363
9.5	.9828330	7872	.1987045	8986	.0862216	2961	167 33 77.0	33.5	0.48	27786
10.0	.9845059	4618	.1910126	2071	.0828837	9587	168 2 89.2	45.7	0.53	27206
10.5	.9861069	0645	.1833070	5019	.0795399	6155	168 31 101.9	58.3	0.57	26621
11.0	.9876360	5954	.1755881	7834	.0761904	2665	169 1 55.0	11.3	0.60	26033
11.5	.9890930	0541	.1678568	:0525	.0728355	9122	169 30 68.4	24.6	0.62	25442
12.0	.9904778	4407	.1601135	3096	.0694752	5524	169 59 82.3	38.4	0.63	24849
12.5	.9917902	7548	.1523589	5554	.0661100	1878	170 28 96.7	52.8	0.63	24253
13.0	.9930302	:9966	.1445935	7903	.0627403	8186	170 58 51.5	7.5	0.64	23654
13.5	.9941978	1659	.1368189	:0152	.0593663	4452	171 27 66.6	22.6	0.63	23053
14.0	.9952930	2629	.1290328	2302	.0559882	:0676	171 56 82.1	38.0	0.62	22450
14.5	.9963155	2872	.1212386	4363	.0526061	6860	172 25 98.0	53.9	0.60	21845
15.0	.9972652	2387	.1134360	6340	.0492204	3008	172 55 54.4	10.2	0.57	21238
15.5	.9981422	1175	.1056255	8238	.0458314	9123	173 24 71.1	26.9	0.54	20629
16.0	.9989464	9235	.0978076	:0061	.0424393	5207	173 53 88.2	44.0	0.50	20019
16.5	.9996780	6569	.0899830	:1818	.0390443	1262	174 23 45.8	1.5	0.46	19408
17.0	1.0003368	3175	.0821522	3512	.0356465	7289	174 52 63.8	19.4	0.41	18796
17.5	1.0009227	9052	.0743157	5149	.0322462	3291	175 21 82.2	37.8	0.35	18183
18.0	1.0014357	4200	.0664741	6735	.0288436	9270	175 50 101.0	56.5	0.29	17570
18.5	1.0018757	8618	.0586279	8275	.0254391	5230	176 20 60.3	15.7	0.23	16955
19.0	1.0022427	2307	.0507776	9774	.0220329	1172	176 49 80.0	35.4	0.17	16340
19.5	1.0025367	5265	.0429237	:1237	.0186253	7101	177 18 100.2	55.6	0.10	15725
20.0	1.0027576	7493	.0350667	2668	.0152162	3014	177 48 60.9	16.2	−0.04	15110
20.5	1.0029055	8990	.0272074	4077	.0118062	8919	178 17 82.0	37.3	+0.02	14496
21.0	1.0029803	9737	.0193461	5465	.0083954	4815	178 47 43.6	58.8	0.08	13883
21.5	1.0029821	9793	.0114836	6841	.0049839	:0705	179 16 65.7	20.8	0.14	13270
22.0	1.0029108	9099	+.0036203	8209	+.0015720	6590	179 45 88.2	43.3	0.19	12657
22.5	1.0027664	7674	−.0042433	0426	−.0018400	7526	180 15 51.3	6.3	0.24	12044
23.0	1.0025489	5518	.0121066	:9059	.0052519	1641	180 44 74.9	29.8	0.28	11432
23.5	1.0022582	2630	.0199690	7682	.0086634	5752	181 13 99.0	53.9	0.32	10820
24.0	1.0018943	9009	.0278300	6292	.0120743	:9857	181 43 63.6	18.4	0.36	10208
24.5	1.0014571	4656	.0356891	4883	.0154844	3954	182 12 86.7	43.4	0.38	09597
25.0	1.0009467	9571	.0435457	3449	.0188936	8042	182 42 54.3	9.0	0.40	08986
25.5	1.0003629	3752	.0513993	1985	.0223015	2117	183 11 80.5	35.2	0.41	08376
26.0	.9997059	7201	.0592494	0487	.0257080	6179	183 41 47.3	1.9	0.41	07766
26.5	.9989754	9915	.0670995	:8948	.0291127	0222	184 10 74.7	29.2	0.41	07156
27.0	.9981716	1896	.0749369	7363	.0325154	4246	184 39 102.6	57.1	0.40	06546
27.5	.9972944	3143	.0827732	5726	.0359158	8246	185 9 71.0	25.5	0.38	05936
28.0	.9963439	3657	.0906037	4032	.0393138	2223	185 38 100.0	54.4	0.36	05326
28.5	.9953200	3437	.0984279	2275	.0427090	6171	186 8 69.6	24.0	0.33	04716
29.0	.9942228	2485	.1062452	0449	.0461014	0092	186 37 99.8	54.1	0.29	04106
29.5	.9930522	0798	.1140550	:8548	.0494905	3980	187 7 70.6	24.8	0.24	03494
30.0	.9918083	8378	.1218568	6568	.0528762	7834	187 36 101.9	56.1	0.19	02882
30.5	.9904910	5224	.1296499	4501	.0562581	1650	188 6 73.9	28.1	0.14	02271
Oct. 1.0	.9891004	1338	.1374338	2342	.0596362	5428	188 36 46.5	0.6	0.08	01659
1.5	.9876364	6717	.1452079	0085	.0630099	:9162	189 5 79.6	33.6	+0.02	01045
2.0	.9860992	1364	.1529715	7723	.0663792	2852	189 35 53.2	7.1	−0.05	00430
2.5	−.9844887	5278	−.1607241	5251	−.0697437	6494	190 4 87.5	41.3	−0.12	◆99814

◆ The first figures of this and the following logarithms are 9.99.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ=☉'s True Longitude.	λ′	β=☉'s Latitude.	Log. Rad. Vect.=ρ.
Oct. 3.0	−.9828051	8462	−.1684651	2663	−.0731032	0087	190° 34′ 62.4″	16.2″	−0.19″	9.99 99197
3.5	.9810484	0914	.1761939	:9953	.0764573	3625	191 3 97.8	51.5	0.26	98579
4.0	.9792187	2536	.1839098	7115	.0798058	7108	191 33 73.7	27.4	0.32	97959
4.5	.9773161	3629	.1916122	4142	.0831483	0530	192 3 50.2	3.8	0.39	97338
5.0	.9753406	3894	.1993005	1028	.0864848	3893	192 32 87.3	40.8	0.45	96717
5.5	.9732923	3430	.2069741	7767	.0898148	7190	193 2 64.9	18.4	0.51	96094
6.0	.9711714	2241	.2146322	4351	.0931381	0421	193 31 103.0	56.5	0.57	95469
6.5	.9689781	:0327	.2222744	0776	.0964545	3583	194 1 81.7	35.1	0.62	94843
7.0	.9667124	7690	.2298999	7030	.0997637	6673	194 31 60.9	14.2	0.67	94215
7.5	.9643746	4331	.2375083	3123	.1030654	:9688	195 0 100.5	53.8	0.71	93587
8.0	.9619648	:0253	.2450990	:9034	.1063595	2627	195 30 80.6	33.9	0.74	92958
8.5	.9594831	5455	.2526714	4762	.1096455	5485	196 0 61.3	14.5	0.77	92327
9.0	.9569296	9940	.2602248	0300	.1129232	8260	196 29 102.5	55.6	0.79	91695
9.5	.9543046	3709	.2677586	5642	.1161924	0950	196 59 84.2	37.2	0.80	91062
10.0	.9516083	6766	.2752721	0782	.1194527	3551	197 29 66.3	19.3	0.80	90429
10.5	.9488410	9112	.2827647	5712	.1227040	6062	197 59 48.9	1.9	0.80	89795
11.0	.9460028	0750	.2902359	0429	.1259459	8480	198 28 91.9	44.8	0.79	89160
11.5	.9430940	1681	.2976851	4926	.1291782	0802	198 58 75.3	28.2	0.77	88525
12.0	.9401148	1909	.3051117	:9197	.1324007	3026	199 28 59.2	12.0	0.74	87891
12.5	.9370654	1434	.3125152	3237	.1356131	5149	199 57 103.6	56.3	0.71	87256
13.0	.9339461	:0261	.3198951	7042	.1388152	7169	200 27 88.4	41.1	0.68	86621
13.5	.9307571	8390	.3272507	0603	.1420068	9084	200 57 73.7	26.4	0.63	85987
14.0	.9274986	5825	.3345816	3917	.1451875	0890	201 27 59.4	12.0	0.57	85354
14.5	.9241709	2567	.3418872	6980	.1483573	2587	201 56 105.5	58.1	0.52	84721
15.0	.9207748	8621	.3491669	9783	.1515158	4172	202 26 92.1	44 6	0.46	84089
15.5	.9173091	3988	.3564201	2321	.1546629	5642	202 56 79.1	31.6	0.40	83460
16.0	.9137755	8672	.3636464	4590	.1577983	6996	203 26 66.5	18.9	0.34	82832
16.5	.9101738	2674	.3708452	6584	.1609218	8230	203 56 54.4	6.7	0.28	82205
17.0	.9065042	5997	.3780161	:8300	.1640330	:9342	204 25 102.8	55.0	0.21	81580
17.5	.9027671	8645	.3851585	:9730	.1671319	0331	204 55 91.6	43.7	0.15	80957
18.0	.8989627	:0624	.3922718	0870	.1702182	1194	205 25 80.8	32.9	0.08	80336
18.5	.8950913	1926	.3993557	1716	.1732917	1929	205 55 70.5	22.6	−0.02	79718
19.0	.8911532	2564	.4064094	2260	.1763522	2534	206 25 60.7	12.7	+0.03	79103
19.5	.8871487	2538	.4134326	2499	.1793995	3007	206 55 51.3	3.3	0.08	78491
20.0	.8830780	1851	.4204249	2430	.1824333	3345	207 24 102.4	54.3	0.13	77881
20.5	.8789413	:0503	.4273857	2045	.1854535	3547	207 54 93.9	45.8	0.17	77273
21.0	.8747388	8497	.4343143	1339	.1884598	3610	208 24 85.9	37.7	0.21	76668
21.5	.8704709	5837	.4412103	0307	.1914521	3533	208 54 78.5	30.2	0.24	76068
22.0	.8661380	2527	.4480733	:8945	.1944301	3314	209 24 71.5	23.1	0.26	75471
22.5	.8617403	8569	.4549028	7248	.1973936	2949	209 54 64.9	16.5	0.27	74877
23.0	.8572780	3965	.4616983	5211	.2003423	2437	210 24 58.9	10.4	0.28	74285
23.5	.8527515	8719	.4684594	2830	.2032761	1775	210 54 53.5	4.9	0.28	73697
24.0	.8481609	2832	.4751856	0101	.2061947	0962	211 24 48.6	0.0	0.27	73112
24.5	.8435066	6308	.4818762	7016	.2090980	:9996	211 53 104.2	55.6	0.25	72530
25.0	.8387888	9149	.4885308	3571	.2119856	8873	212 23 100.3	51.6	0.23	71952
25.5	.8340078	1357	.4951489	:9761	.2148575	7593	212 53 96.9	48.1	0.20	71377
26.0	.8291638	2936	.5017300	5581	.2177135	6154	213 23 94.1	45.2	0.16	70804
26.5	.8242572	3889	.5082737	1027	.2205531	4551	213 53 91.9	42.9	0.12	70234
27.0	.8192884	4220	.5147793	6092	.2233763	2785	214 23 90.2	41.1	0.07	69667
27.5	.8142576	3931	.5212463	0771	.2261827	0850	214 53 89.0	39.8	+0.01	69102
28.0	.8091652	3025	.5276742	5060	.2289723	8748	215 23 88.4	39.1	−0.05	68540
28.5	.8040116	1507	.5340626	:8954	.2317448	6474	215 53 88.3	38.9	0.11	67981
29.0	.7987968	9378	.5404108	2446	.2344998	4026	216 23 88.8	39.3	0.17	67425
29.5	.7935214	6643	.5467185	5533	.2372372	1401	216 53 89.8	40.3	0.24	66870
30.0	.7881856	3303	.5529850	8208	.2399568	8599	217 23 91.3	41.8	0.31	66317
30.5	.7827898	9364	.5592099	0467	.2426583	5616	217 53 93.4	43.8	0.38	65766
31.0	.7773343	4827	.5653927	2306	.2453415	2450	218 23 96.1	46.4	0.45	65218
31.5	.7718194	9696	.5715329	3719	.2480062	:9099	218 53 99.3	49.6	0.52	64671
Nov. 1.0	.7662456	3976	.5776298	4699	.2506521	5561	219 23 103.0	53.3	0.59	64126
1.5	.7606133	7671	.5836831	5243	.2532790	1832	219 53 107.2	57.4	0.66	63582
2.0	−.7549224	:0785	−.5896921	5344	−.2558867	7912	220 24 52.0	2.1	−0.72	63040

NOTE.—: denotes a change in the preceding figure.

SUN'S COÖRDINATES, 1877.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
Nov. 2.5	—.7491748	3322	—.6956564	4998	—.2584749	3796	220° 54′ 57″.2	7″.3	—0″.77	9.99 62499
3.0	.7433695	5287	.6015753	4198	.2610435	;9485	221 24 62.9	12.9	0.81	61959
3.5	.7375073	6683	.6074484	2940	.2635921	4974	221 54 69.2	19.1	0.86	61421
4.0	.7315886	7514	.6132752	1220	.2661207	0263	222 24 75.9	25.8	0.90	60885
4.5	.7256139	7785	.6190552	;9032	.2686289	5348	222 54 83.1	32.9	0.93	60350
5.0	.7195837	7500	.6247879	6371	.2711167	0229	223 24 90.7	40.4	0.95	59816
5.5	.7134984	6665	.6304729	3233	.2735837	4902	223 54 98.8	48.4	0.96	59283
6.0	.7073585	5283	.6361097	;9613	.2760297	;9365	224 24 107.4	56.9	0.97	58752
6.5	.7011645	3361	.6416979	5507	.2784546	3617	224 55 56.3	5.8	0.97	58223
7.0	.6949169	;0902	.6472369	0910	.2808580	7655	225 25 65.6	15.1	0.96	57695
7.5	.6886162	7912	.6527262	5815	.2832398	1476	225 55 75.4	24.8	0.94	57168
8.0	.6822630	4397	.6581654	0220	.2855998	5080	226 25 85.6	34.9	0.92	56644
8.5	.6758577	;0362	.6635541	4120	.2879379	8464	226 55 96.1	45.3	0.89	56123
9.0	.6694009	5811	.6688917	7509	.2902538	1627	227 25 107.0	56.1	0.85	55603
9.5	.6628932	;0751	.6741779	0384	.2925474	4567	227 56 58.3	7.3	0.81	55084
10.0	.6563351	5187	.6794123	2742	.2948184	7281	228 26 69.9	18.8	0.76	54568
10.5	.6497270	9123	.6845946	4578	.2970668	;9769	228 56 81.9	30.7	0.71	54055
11.0	.6430694	2564	.6897243	5889	.2992923	2028	229 26 94.3	43.0	0.65	53545
11.5	.6363628	5515	.6948010	6669	.3014949	4058	229 56 107.1	55.8	0.59	53037
12.0	.6296077	7980	.6998244	6917	.3036743	5856	230 27 60.2	8 9	0.53	52533
12.5	.6228046	9966	.7047940	6627	.3058304	7421	230 57 73.6	22.2	0.47	52033
13.0	.6159541	;1477	.7097095	5796	.3079631	8753	231 27 87.3	35.9	0.40	51536
13.5	.6090569	2521	.7145705	4420	.3100720	;9846	231 57 101.4	49.9	0.34	51042
14.0	.6021135	3103	.7193766	2496	.3121571	0702	232 28 55.8	4.2	0.27	50552
14.5	.5951244	3228	.7241275	0029	.3142183	1318	232 58 70.5	18.8	0.21	50067
15.0	.5880902	2902	.7288229	6988	.3162553	1693	233 28 85.5	33.7	0.15	49586
15.5	.5810116	2132	.7334624	3398	.3182681	1826	233 58 100.9	49.0	0.09	49109
16.0	.5738890	;0925	.7380457	;9246	.3202565	1715	234 29 56.6	4.6	—0.04	48637
16.5	.5667227	9275	.7425724	4528	.3222205	1360	234 59 72.6	20.5	0.00	48170
17.0	.5595131	7194	.7470421	;9240	.3241598	0758	235 29 88.9	36.7	+0.04	47708
17.5	.5522609	4688	.7514547	3381	.3260743	;9908	235 59 105.6	53.4	0.07	47250
18.0	.5449667	;1761	.7558098	6948	.3279639	8809	236 30 62.7	10.4	+0.10	46797
18.5	.5376310	8420	.7601070	;9935	.3298285	7460	237 0 80.1	27.7	0.11	46351
19.0	.5302543	4668	.7643460	2341	.3316679	5860	237 30 97.8	45.3	0.12	45910
19.5	.5228371	;0511	.7685266	4163	.3334820	4006	238 1 55.8	3.2	0.12	45474
20.0	.5153801	5956	.7726484	5397	.3352705	1897	238 31 74.3	21.6	0.12	45043
20.5	.5078837	;1007	.7767112	6040	.3370334	;9531	239 1 93.1	40.3	0.10	44618
21.0	.5003485	5669	.7807146	6091	.3387705	6908	239 31 112.2	59.3	0.08	44199
21.5	·4927751	9950	.7846584	5545	.3404819	4028	240 2 71.6	18.6	0.06	43785
22.0	.4851640	3853	.7885423	4401	.3421673	0888	240 32 91.5	38.5	+0.03	43378
22.5	.4775156	7384	.7923659	2653	.3438266	7487	241 2 111.8	58.7	—0.01	42977
23.0	.4698303	;0545	.7961288	0299	.3454596	3823	241 33 72.4	19.2	0.05	42581
23.5	.4621087	3343	.7998307	7334	.3470662	;9865	242 3 93.4	40.1	0.10	42190
24.0	.4543512	5782	.8034714	3759	.3486462	5762	242 34 54.8	1.4	0.15	41804
24.5	.4465585	7869	.8070505	;0566	.3501996	1242	243 4 76.6	23.1	0.21	41424
25.0	.4387313	9611	.8105678	4758	.3517261	6514	243 34 98.8	45.2	0.27	41049
25.5	.4308700	;1012	.8140230	;9327	.3532257	1516	244 5 61.4	7.7	0.33	40680
26.0	.4229753	;2078	.8174158	3273	.3546982	6248	244 35 84.4	30.6	0.39	40316
26.5	.4150477	2816	.8207459	6591	.3561435	0708	245 5 107.7	53.9	0.46	39956
27.0	.4070877	3229	.8240129	;9279	.3575614	4894	245 36 71.4	17.5	0.53	39601
27.5	.3990960	3325	.8272165	1333	.3589517	8804	246 6 95 6	41.6	0.60	39251
28.0	.3910732	3110	.8303564	2750	.3603144	2438	246 37 60.2	6.1	0.66	38906
28.5	.3830197	2588	.8334323	3527	.3616494	5795	247 7 85.0	30.8	0.72	38564
29.0	.3749362	;1765	.8364438	3660	.3629564	8872	247 37 110.2	55.9	0.78	38226
29.5	.3668233	;0649	.8393908	3149	.3642354	1669	248 8 75.8	21.4	0.83	37893
30 0	.3586816	9246	.8422729	1989	.3654862	4184	248 38 101.8	47.3	0.88	37565
30.5	.3505120	7560	.8450899	0178	.3667087	6416	249 9 68.0	13.4	0.92	37241
Dec. 1.0	.3423150	5602	.8478415	7712	.3679029	8366	249 39 94.6	39.9	0.95	36920
1.5	.3340912	3378	.8505275	4591	.3690685	0030	250 10 61.6	6.8	0.98	36602
2.0	.3258412	;0888	.8531476	0811	.3702054	1407	250 40 88.9	34.0	1.01	36288
2.5	—.3175658	8146	—.8557014	6368	—.3713136	2497	251 11 56.4	1.4	—1.02	35978

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. $0^{d}.0$.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1877.	X.	X′.	Y.	Y′.	Z.	Z′.	λ = ☉'s True Longitude.	λ′	β = ☉'s Latitude.	Log. Rad. Vect. = ρ.
							° ′ ″	″	″	9.99
Dec. 3.0	−.3092655	5156	−.8581888	1261	−.3723930	3298	251 41 84.3	29.2	−1.03	35671
3.5	.3009410	:1920	.8606907	5489	.3734435	3811	252 11 112.5	57.3	1.03	35368
4.0	.2925929	8450	.8629637	9049	.3744648	4032	252 42 81.0	25.7	1.03	35069
4.5	.2842219	4751	.8652506	1937	.3754570	3962	253 12 109.7	54.3	1.01	34773
5.0	.2758288	:0831	.8674702	4153	.3764200	3600	253 43 78.6	23.1	0.99	34480
5.5	.2674141	6695	.8696223	5694	.3773536	2944	254 13 107.8	52.2	0.96	34191
6.0	.2589785	:2349	.8717066	6557	.3782578	1994	254 44 77.2	21.6	0.93	33905
6.5	2505229	7798	.8737230	6741	.3791325	0749	255 14 106.9	51.2	0.89	33623
7.0	.2420481	3065	.8756713	6244	.3799777	9209	255 45 76.8	21.0	0.84	33345
7.5	.2335548	8137	.8775514	5065	.3807932	7372	256 15 106.9	51.0	0.79	33070
8.0	.2250436	3040	.8793631	3203	.3815791	5240	256 46 77.2	21.2	0.73	32799
8.5	.2165150	7764	.8811064	0656	.3823352	2809	257 16 107.6	51.5	0.67	32533
9.0	.2079698	:2321	.8827811	7424	.3830615	0081	257 47 78.2	22.0	0.61	32270
9.5	.1994088	6720	.8843871	3504	.3837580	7054	258 17 108.9	52.6	0.55	32011
10.0	.1908327	:0968	.8859243	8897	.3844246	3729	258 48 79.7	23.3	0.48	31757
10.5	.1822423	5073	.8873926	3601	.3850613	0104	259 18 110.7	54.2	0.41	31509
11.0	.1736381	9039	.8887919	7615	.3856681	6181	259 49 81.8	25.2	0.34	31265
11.5	.1650206	2873	.8901221	0938	.3862450	1959	260 19 113.1	56.4	0.28	31025
12.0	.1563906	6581	.8913831	3570	.3867919	7437	260 50 84.5	27.7	0.22	30790
12.5	.1477489	:0172	.8925748	5508	.3873087	2614	261 20 115.9	59.0	0.17	30561
13.0	.1390961	3652	.8936973	6755	.3877955	7491	261 51 87.5	30.5	0.11	30338
13.5	.1304330	7029	.8947505	7308	.3882521	2066	262 22 59.2	2.1	0.06	30120
14.0	.1217602	:0308	.8957343	7168	.3886787	6342	262 52 91.0	33.8	−0.01	29908
14.5	.1130783	3496	.8966486	6332	.3890751	0315	263 23 62.8	5.5	+0.03	29702
15.0	.1043880	6600	.8974934	4802	.3894415	3989	263 53 94.9	37.4	0.05	29502
15.5	.0956898	9625	.8982686	2576	.3897777	7360	264 24 66.9	9.4	0.08	29308
16.0	.0869845	:2579	.8989740	9653	.3900838	0431	264 54 99.1	41.5	0.10	29121
16.5	.0782727	5468	.8996100	6034	.3903597	3199	265 25 71.4	13.8	0.10	28940
17.0	.0695551	8298	.9001762	1718	.3906054	5666	265 55 103.8	46.1	0.10	28766
17.5	.0608324	:1077	.9006727	6705	.3908209	7830	266 26 76.2	18.4	0.10	28598
18.0	.0521053	3812	.9010996	0996	.3910062	:9693	266 56 108.7	50.8	0.09	28438
18.5	.0433744	6509	.9014567	4589	.3911613	1283	267 27 81.4	23.4	0.06	28285
19.0	.0346404	9174	.9017442	7487	.3912861	2511	267 57 114.2	56.1	+0.03	28138
19.5	.0259037	:1813	.9019620	9687	.3913817	3477	268 28 87 1	28.9	0.00	27998
20.0	.0171649	4430	.9021099	1189	.3914451	4121	268 59 60.0	1.7	−0.04	27865
20.5	−.0084247	7033	.9021881	1993	.3914792	4472	269 29 93.1	34.7	0.09	27739
21.0	+.0003162	0372	.9021965	2100	.3914830	4520	270 0 66.3	7.8	0.14	27621
21.5	.0090572	:7777	.9021351	1509	.3914565	4265	270 30 99.7	41.1	0.19	27510
22.0	.0177978	5179	.9020038	0219	.3913998	3708	271 1 73.2	14.5	0.25	27406
22.5	.0265373	2570	.9018026	8230	.3913127	2847	271 31 106.8	48.0	0.31	27308
23.0	.0352751	:9944	.9015315	5542	.3911954	1684	272 2 80.6	21.7	0.38	27217
23.5	.0440106	:7295	.9011965	2155	.3910478	0218	272 32 114.5	55.5	0.44	27133
24.0	.0527430	4616	.9007796	8069	.3908699	8450	273 3 88.6	29.5	0.51	27055
24.5	.0614715	1898	.9002989	3285	.3906617	6378	273 34 62.8	3.6	0.58	26984
25.0	.0701956	:9136	.8997484	7803	.3904232	4004	274 4 97.1	37.8	0.64	26919
25.5	.0789145	6322	.8991280	1622	.3901544	1326	274 35 71.5	12.1	0.70	26861
26.0	.0876276	3451	.8984378	4744	.3898552	8345	275 5 106.1	46.6	0.75	26809
26.5	.0963344	0517	.8976777	7166	.3895258	5061	275 36 80.7	21.1	0.80	26763
27.0	.1050341	:7512	.8968477	8890	.3891657	1471	276 6 115.5	55.8	0.85	26722
27.5	.1137259	4428	.8959478	9914	.3887755	7579	276 37 90.4	30.6	0.89	26687
28.0	.1224091	1258	.8949780	:0240	.3883549	3384	277 8 65.5	5.6	0.93	26658
28.5	.1310833	:7999	.8939384	9867	.3879039	8884	277 38 100.6	40.6	0.96	26633
29.0	.1397477	4642	.8928289	8796	.3874226	4082	278 9 75.8	15.7	0.98	26613
29.5	.1484017	1181	.8916499	7029	.3869111	8978	278 39 111.1	50.9	1.00	26599
30.0	.1570443	7606	.8904012	4566	.3863693	3571	279 10 86.6	26.3	1.01	26590
30.5	.1656750	3913	.8890832	1409	.3857973	7862	279 41 62.1	1.7	1.01	26585
31.0	.1742931	0094	.8876955	7556	.3851951	1850	280 11 97.7	37.2	1.01	26585
31.5	.1828978	6141	.8862385	3010	.3845628	5538	280 42 73.3	12.7	1.01	26590
32.0	+.1914883	2046	−.8847121	7770	−.3839004	8925	281 12 108.9	48.2	−0.98	26600

NOTE.—: denotes a change in the preceding figure.

MERCURY.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$
Jan. 0	240 6620	+0.3517	−0.1321	−0.0426	9.5787	339° 22′.3	−6.29	+ 2.37	+0.76
5	6625	0.3484	+0.0129	0.0301	9.5444	1 59.1	7.89	− 0.29	0.68
10	6630	0.2861	0.1549	−0.0125	9.5121	28 25.1	8.09	4.38	+0.36
15	6635	0.1641	0 2631	+0.0076	9.4911	58 24.1	5.37	8.61	−0.25
20	6640	+0.0030	0.3087	0.0258	9.4902	89 59.7	−0.11	10.13	0.85
25	6645	−0.1593	0.2779	0.0378	9.5098	120 12.4	+4.58	7.98	1.09
30	6650	0.2885	0.1881	0.0418	9.5416	146 57.4	6.66	4.35	0.97
Feb. 4	6655	0.3684	+0.0650	0.0385	9.5759	169 51.8	6.71	− 1.18	0.70
9	6660	0.3978	−0.0676	0.0299	9.6071	189 31.8	5.85	+ 0.99	0.44
14	6665	0.3829	0.1934	0.0180	9.6324	206 47.0	4.72	2.38	0.22
19	6670	0.3321	0.3012	+0.0043	9.6512	222 22.0	3.60	3.26	−0.04
24	6675	0.2538	0.3847	−0.0098	9.6632	236 52.8	2.54	3.83	+0.09
March 1	6680	0.1564	0.4390	0.0231	9.6687	250 49.2	1.50	4.22	0.22
6	6685	−0.0476	0.4613	0.0347	9.6676	264 37.2	+0.46	4.46	0.33
11	6690	+0.0648	0.4498	0.0438	9.6600	278 41.8	−0.66	4.59	0.44
16	6695	0.1720	0.4036	0.0495	9.6458	293 29.9	1.93	4.54	0.56
21	6700	0.2643	0.3230	0.0510	9.6249	309 33.1	3.44	4.20	0.66
26	6705	0.3303	0.2109	0.0474	9.5975	327 30.1	5.18	3.32	0.74
31	6710	0.3568	−0.0742	0.0383	9.5649	348 7.8	7.01	+ 1.46	0.75
April 5	6715	0.3306	+0.0725	0.0235	9.5306	12 14.8	8.25	− 1.80	0.58
10	6720	0.2432	0.2047	−0.0045	9.5016	40 14.2	7.40	6.23	+0.13
15	6725	+0.1015	0.2902	+0.0154	9.4881	71 12.3	−3.39	9.70	−0.52
20	6730	−0.0651	0.3042	0.0315	9.4961	102 35.3	+2.05	9.62	1.00
25	6735	0.2171	0.2472	0.0404	9.5212	131 32.6	5.74	6.55	1.07
30	6740	0.3273	0.1406	0.0412	9.5556	156 42.0	6.86	2.95	0.87
May 5	6745	0.3861	+0.0114	0.0355	9.5892	178 11.6	6.41	− 0.19	0.59
10	6750	0.3966	−0.1203	0.0254	9.6181	196 46.9	5.40	+ 1.63	0.35
15	6755	0.3661	0.2397	+0.0125	9.6408	213 16.6	4.25	2.79	−0.14
20	6760	0.3032	0.3383	−0.0015	9.6568	228 21.6	3.16	3.53	+0.02
25	6765	0.2161	0.4103	0.0153	9.6662	242 35.1	2.11	4.00	0.15
30	6770	0.1131	0.4520	0.0281	9.6690	256 25.1	1.08	4.33	0.27
June 4	6775	−0.0019	0.4608	0.0388	9.6653	270 16.7	+0.02	4.53	0.38
9	6780	+0.1095	0.4352	0.0466	9.6551	284 35.6	−1.15	4.59	0.49
14	6785	0.2118	0.3750	0.0506	9.6381	299 50.1	2.51	4.44	0.60
19	6790	0.2949	0.2811	0.0502	9.6145	316 34.3	4.12	3.93	0.70
24	6795	0.3467	0.1578	0.0444	9.5848	335 30.5	5.94	2.71	0.76
29	6800	0.3533	−0.0148	0.0329	9.5509	357 27.8	7.65	+ 0.32	0.71
July 4	6805	0.3026	+0.1296	−0.0161	9.5176	23 9.4	8.25	− 3.64	+0.44
9	6810	0.1909	0.2469	+0.0038	9.4937	52 34.0	6.13	7.94	−0.12
14	6815	+0.0346	0.3055	0.0227	9.4887	84 4.7	−1.15	10.16	0.76
19	6820	−0.1305	0.2888	0.0361	9.5049	114 45.5	+3.88	8.59	1.07
24	6825	0.2677	0.2084	0.0416	9.5352	142 14.0	6.46	5.03	1.00
29	6830	0.3573	+0.0896	0.0396	9.5696	165 49.9	6.80	− 1.71	0.76
Aug. 3	6835	0.3958	−0.0429	0.0318	9.6016	186 2.6	6.04	+ 0.65	0.49
8	6840	0.3886	0.1708	0.0203	9.6281	203 41.4	4.93	2.17	0.26
13	6845	0.3439	0.2827	+0.0069	9.6481	219 32.3	3.80	3.12	−0.08
18	6850	0.2702	0.3710	−0.0072	9.6614	234 12.7	2.73	3.74	+0.07
23	6855	0.1758	0.4310	0.0207	9.6681	248 13.5	1.70	4.15	0.20
28	6860	−0.0684	0.4596	0.0327	9.6683	262 1.2	+0.66	4.41	0.31
Sept. 2	6865	+0.0438	0.4547	0.0423	9.6619	276 0.7	−0.44	4.58	0.43
7	6870	0.1527	0.4150	0.0487	9.6490	290 38.4	1.68	4.56	0.54
12	6875	+0.2486	−0.3408	−0.0511	9.6293	306 24.8	−3.13	+ 4.29	+0.64

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

MERCURY.

1877.		Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
		240					° ′			
Sept.	17	6880	+0.3205	-0.2342	-0.0485	9.6031	323 57.1	-4.84	+ 3.54	+0.73
	22	6885	0.3556	-0.1014	0.0404	9.5713	344 0.7	6.68	+ 1.91	0.76
	27	6890	0.3402	+0.0452	0.0266	9.5369	7 25.2	8.12	- 1.09	0.63
Oct.	2	6895	0.2611	0.1826	-0.0082	9.5062	34 42.0	7.78	5.38	+0.25
	7	6900	+0.1311	0.2791	+0.0119	9.4890	65 15.7	-4.35	9.26	-0.40
	12	6905	-0.0337	0.3075	0.0290	9.4930	96 48.5	+1.09	9.94	0.93
	17	6910	0.1912	0.2625	0.0394	9.5161	126 22.8	5.27	7.23	1.08
	22	6915	0.3104	0.1632	0.0416	9.5491	152 16.4	6.81	3.58	0.91
	27	6920	0.3790	+0.0364	0.0370	9.5831	174 24.3	6.56	- 0.64	0.64
Nov.	1	6925	0.3980	-0.0961	0.0275	9.6131	193 28.5	5.61	+ 1.35	0.39
	6	6930	0.3745	0.2186	0.0151	9.6371	210 18.4	4.47	2.61	0.18
	11	6935	0.3170	0.3217	+0.0012	9.6544	225 36.5	3.36	3.41	-0.01
	16	6940	0.2339	0.3990	-0.0128	9.6650	239 57.5	2.31	3.92	+0.12
	21	6945	0.1333	0.4465	0.0258	9.6690	253 49.9	1.28	4.27	0.24
	26	6950	-0.0231	0.4617	0.0369	9.6665	267 39.3	+0.23	4.50	0.36
Dec.	1	6955	+0.0890	0.4427	0.0454	9.6575	281 51.0	-0.92	4.60	0.47
	6	6960	0.1937	0.3889	0.0502	9.6418	296 52.6	2.24	4.49	0.58
	11	6965	0.2813	0.3012	0.0506	9.6194	313 17.1	3.79	4.06	0.68
	16	6970	0.3400	0.1828	0.0459	9.5908	331 44.9	5.59	3.01	0.75
	21	6975	0.3562	-0.0429	0.0355	9.5574	353 4 4	7.37	+ 0.88	0.74
	26	6980	0.3168	+0.1037	0.0197	9.5235	18 1.9	8.29	- 2.72	+0.51
	31	6985	0.2160	0.2285	-0.0001	9.4970	46 48.6	6.79	7.17	0.00
	36	6990	+0.0656	+0.2998	+0.0195	9.4879	78 8.0	-2.20	-10.03	-0.66

VENUS.

1877.		Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
		240					° ′			
Jan.	0	6620	-0.6503	-0.3121	+0.0327	9.8586	205 35.3	+20.98	+10.07	-1.05
	5	6625	0.6010	0.4004	0.0286	9.8590	213 37.2	19.33	12.87	0.92
	10	6630	0.5400	0.4808	0.0239	9.8594	221 38.2	17.32	15.42	0.77
	15	6635	0.4684	0.5519	0.0187	9.8598	229 38.2	14.98	17.64	0.60
	20	6640	0.3878	0.6122	0.0132	9.8602	237 37.3	12.36	19.52	0.42
	25	6645	0.2996	0.6607	0.0074	9.8606	245 35.6	9.53	21.01	0.24
	30	6650	0.2056	0.6963	+0.0015	9.8610	253 33 0	6.52	22.09	-0.05
Feb.	4	6655	0.1076	0.7186	-0.0045	9.8613	261 29.7	3.40	22.74	+0.14
	9	6660	-0.0076	0.7270	0.0103	9.8616	269 25.7	+ 0.24	22.96	0.33
	14	6665	+0.0926	0.7214	0.0160	9.8618	277 21.1	- 2.92	22.74	0.50
	19	6670	0.1910	0.7020	0.0214	9.8620	285 16.0	6.02	22.10	0.67
	24	6675	0.2858	0.6691	0.0263	9.8622	293 10.6	8.99	21.05	0.83
March	1	6680	0.3751	0.6234	0.0308	9.8623	301 4.9	11.79	19.60	0.97
	6	6685	0.4572	0.5658	0.0346	9.8623	308 59.1	14.37	17.78	1.09
	11	6690	0.5305	0.4974	0.0378	9.8623	316 53.3	16.67	15.63	1.19
	16	6695	0.5938	0.4195	0.0403	9.8622	324 47.5	18.67	13.19	1.27
	21	6700	0.6456	0.3335	0.0420	9.8621	332 42.0	20.32	10.50	1.32
	26	6705	0.6851	0.2412	0.0429	9.8619	340 36.8	21.60	7.60	1.35
	31	6710	0.7114	0.1442	0.0430	9.8616	348 32.1	22.47	4.56	1.36
April	5	6715	0.7241	-0.0445	0.0422	9.8614	356 27.9	22.91	+ 1.41	1.34
	10	6720	0.7229	+0.0561	0.0407	9.8610	4 24.3	22.92	- 1.78	1.29
	15	6725	0.7077	0.1556	0.0383	9.8607	12 21.6	22.49	4.94	1.22
	20	6730	+0.6788	+0.2521	-0.0352	9.8603	20 19.7	-21.63	- 8.03	+1.12

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

VENUS.

1877.		Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
April	25	240 6735	+0.6368	+0.3437	−0.0315	9.8599	28° 18′.6	−20.34	−10.98	+1.00
	30	6740	0.5824	0.4287	0.0271	9.8595	36 18.4	18.66	13.74	0.87
May	5	6745	0.5166	0.5052	0.0222	9.8591	44 19.1	16.60	16.24	0.71
	10	6750	0.4408	0.5719	0.0168	9.8587	52 20.7	14.20	18.43	0.54
	15	6755	0.3563	0.6274	0.0111	9.8583	60 23.2	11.51	20.28	0.36
	20	6760	0.2648	0.6706	−0.0053	9.8579	68 26.6	8.58	21.73	+0.17
	25	6765	0.1681	0.7005	+0.0007	9.8576	76 30.8	5.46	22.75	−0.02
	30	6770	+0.0680	0.7166	0.0067	9.8572	84 35.8	− 2.21	23.32	0.22
June	4	6775	−0.0334	0.7185	0.0126	9.8570	92 41.4	+ 1.09	23.43	0.41
	9	6780	0.1341	0.7061	0.0182	9.8567	100 47.6	4.38	23.07	0.59
	14	6785	0.2322	0.6798	0.0234	9.8566	108 54.2	7.59	22.23	0.76
	19	6790	0.3256	0.6399	0.0282	9.8564	117 1.2	10.66	20.94	0.92
	24	6795	0.4126	0.5872	0.0323	9.8564	125 8.4	13.51	19.23	1.06
	29	6800	0.4913	0.5228	0.0360	9.8564	133 15.6	16.08	17.12	1.18
July	4	6805	0.5602	0.4482	0.0388	9.8564	141 22.8	18.33	14.67	1.27
	9	6810	0.6180	0.3645	0.0409	9.8565	149 29.9	20.21	11.92	1.34
	14	6815	0.6635	0.2735	0.0421	9.8567	157 36.6	21.68	8.93	1.38
	19	6820	0.6959	0.1772	0.0426	9.8569	165 42.9	22.70	5.78	1.39
	24	6825	0.7144	+0.0773	0.0422	9.8572	173 48.6	23.26	− 2.52	1.37
	29	6830	0.7187	−0.0241	0.0409	9.8575	181 53.7	23.35	+ 0.78	1.33
Aug.	3	6835	0.7088	0.1250	0.0388	9.8578	189 58.0	22.98	4.05	1.26
	8	6840	0.6850	0.2236	0.0360	9.8582	198 1.5	22.15	7.23	1.16
	13	6845	0.6477	0.3176	0.0325	9.8586	206 4.2	20.88	10.24	1.05
	18	6850	0.5977	0.4054	0.0283	9.8590	214 6.0	19.21	13.03	0.91
	23	6855	0.5360	0.4854	0.0236	9.8594	222 6.9	17.18	15.55	0.76
	28	6860	0.4639	0.5558	0.0184	9.8598	230 6.9	14.83	17.76	0.59
Sept.	2	6865	0.3827	0.6155	0.0128	9.8602	238 6.0	12.20	19.62	0.41
	7	6870	0.2941	0.6632	0.0070	9.8606	246 4.2	9.35	21.09	0.22
	12	6875	0.1998	0.6980	+0.0011	9.8610	254 1.6	6.34	22.14	−0.04
	17	6880	0.1016	0.7194	−0.0048	9.8613	261 58.2	3.22	22.77	+0.15
	22	6885	−0.0015	0.7270	0.0106	9.8616	269 54.2	+ 0.05	22.96	0.34
	27	6890	+0.0986	0.7206	0.0163	9.8618	277 49.6	− 3.11	22.72	0.52
Oct.	2	6895	0.1968	0.7004	0.0217	9.8620	285 44.5	6.20	22.05	0.68
	7	6900	0.2913	0.6667	0.0266	9.8622	293 39.0	9.16	20.97	0.84
	12	6905	0.3802	0.6203	0.0310	9.8623	301 33.3	11.95	19.50	0.98
	17	6910	0.4618	0.5620	0.0348	9.8623	319 27.5	14.51	17.66	1.09
	22	6915	0.5346	0.4930	0.0380	9.8623	317 21.7	16.80	15.50	1.19
	27	6920	0.5972	0.4145	0.0404	9.8622	325 15.9	18.78	13.04	1.27
Nov.	1	6925	0.6483	0.3282	0.0421	9.8620	333 10.4	20.41	10.33	1.32
	6	6930	0.6870	0.2355	0.0429	9.8619	341 5.2	21.66	7.42	1.35
	11	6935	0.7126	0.1383	0.0430	9.8616	349 0.5	22.50	4.36	1.36
	16	6940	0.7244	−0.0385	0.0422	9.8613	356 56.4	22.92	+ 1.21	1.34
	21	6945	0.7224	+0.0621	0.0405	9.8610	4 53.0	22.90	− 1.97	1.29
	26	6950	0.7063	0.1615	0.0382	9.8607	12 50.3	22.45	5.13	1.22
Dec.	1	6955	0.6766	0.2577	0.0350	9.8603	20 48.4	21.57	8.21	1.12
	6	6960	0.6338	0.3490	0.0312	9.8599	28 47.4	20.26	11.15	1.00
	11	6965	0.5787	0.4335	0.0268	9.8595	36 47.3	18.55	13.89	0.86
	16	6970	0.5123	0.5095	0.0219	9.8591	44 48.0	16.46	16.38	0.70
	21	6975	0.4359	0.5756	0.0165	9.8586	52 49.7	14.05	18.56	0.53
	26	6980	0.3509	0.6304	0.0108	9.8583	60 52.3	11.34	20.37	0.35
	31	6985	0.2590	0.6727	−0.0049	9.8579	68 55.8	8.40	21.80	+0.16
	36	6990	+0.1620	+0.7017	+0.0011	9.8574	77 0.0	− 5.27	−22.80	−0.04

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

THE EARTH.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
Jan. 0	240 6620	−0.1774	+0.9670	0.0000	9.9926	100° 23′.9	+ 2.49	−13.58	0.00
10	6630	0.3458	0.9207		9.9928	110 35.4	4.85	12.91	
20	6640	0.5036	0.8457		9.9931	120 46.4	7.05	11.83	
30	6650	0.6457	0.7444		9.9936	130 56.1	9.00	10.38	
Feb. 9	6660	0.7679	0.6203		9.9944	141 4.0	10.65	8.60	
19	6670	0.8666	0.4772		9.9953	151 9.6	11.94	6.58	
March 1	6680	0.9389	0.3195		9.9963	161 12.5	12.85	4.37	
11	6690	0.9827	+0.1520		9.9975	171 12.4	13.34	− 2.06	
21	6700	0.9968	−0.0200		9.9987	181 9.0	13.42	+ 0.27	
31	6710	0.9813	0.1914		9.9999	191 2.1	13.10	2.56	
April 10	6720	0.9369	0.3571		0.0012	200 51.9	12.40	4.73	
20	6730	0.8651	0.5124		0.0024	210 38.4	11.36	6.72	
30	6740	0.7681	0.6528		0.0035	220 21.7	10.00	8.50	
May 10	6750	0.6489	0.7745		0.0045	230 2.2	8.39	10.02	
20	6760	0.5112	0.8738		0.0054	239 40.1	6.57	11.23	
30	6770	0.3591	0.9485		0.0061	249 15.8	4.59	12.13	
June 9	6780	0.1968	0.9963		0.0067	258 49.8	2.51	12.69	
19	6790	−0.0288	1.0160		0.0071	268 22.7	+ 0.37	12.91	
29	6800	+0.1400	1.0070		0.0072	277 54.7	− 1.78	12.78	
July 9	6810	0.3048	0.9698		0.0072	287 26.7	3.87	12.31	
19	6820	0.4610	0.9054		0.0069	296 59.1	5.87	11.52	
29	6830	0.6042	0.8155		0.0065	306 32.3	7.71	10.41	
Aug. 8	6840	0.7305	0.7027		0.0059	316 6.9	9.36	9.00	
18	6850	0.8361	0.5698		0.0051	325 43.5	10.77	7.32	
28	6860	0.9177	0.4206		0.0041	335 22.3	11.90	5.45	
Sept. 7	6870	0.9730	0.2596		0.0031	345 3.9	12.71	3.39	
17	6880	1.0003	−0.0909		0.0019	354 48.5	13.17	+ 1.20	
27	6890	0.9984	+0.0804		0.0007	4 36.3	13.26	− 1.07	
Oct. 7	6900	0.9671	0.2493		9.9994	14 27.5	12.95	3.34	
17	6910	0.9071	0.4109		9.9982	24 22.1	12.25	5.55	
27	6920	0.8200	0.5602		9.9970	34 20.0	11.17	7.63	
Nov. 6	6930	0.7083	0.6925		9.9959	44 21.1	9.72	9.50	
16	6940	0.5751	0.8037		9.9949	54 25.2	7.95	11.11	
26	6950	0.4243	0.8904		9.9940	64 31.8	5.90	12.38	
Dec. 6	6960	0.2603	0.9497		9.9934	74 40.6	3.63	13.27	
16	6970	+0.0883	0.9797		9.9929	84 51.0	− 1.24	13.73	
26	6980	−0.0863	0.9795		9.9927	95 2.1	+ 1.20	13.74	
36	6990	−0.2583	+0.9489	0.0000	9.9927	105 13.8	+ 3.63	−13.31	0.00

MARS.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
Jan. 0	240 6620	−1.4789	−0.6314	+0.0224	0.20632	203° 6′ 22″	+0.63	+0.27	−0.01
10	6630	1.4130	0.7459	0.0183	0.20354	207 49 11	0.61	0.32	0.01
20	6640	1.3368	0.8550	0.0141	0.20057	212 35 47	0.59	0.38	−0.01
30	6650	1.2508	0.9579	0.0098	0.19742	217 28 26	0.56	0.43	0.00
Feb. 9	6660	1.1553	1.0536	0.0054	0.19412	222 21 27	0.54	0.49	0.00
19	6670	1.0509	1.1410	+0.0010	0.19067	227 21 6	0.50	0.54	0.00
March 1	6680	0.9382	1.2193	−0.0034	0.18711	232 25 37	0.45	0.59	0.00
11	6090	−0.8178	−1.2877	−0.0077	0.18345	237 35 15	+0.41	+0.64	0.00

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

MARS.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
March 21	240 6700	−0.6907	−1.3455	−0.0120	0.17972	242° 50′ 12″	+0.35	+0.69	+0.01
31	6710	0.5576	1.3919	0.0163	0.17596	248 10 37	0.29	0.73	0.01
April 10	6720	0.4197	1.4260	0.0204	0.17219	253 36 40	0.23	0.77	0.01
20	6730	0.2781	1.4471	0.0242	0.16846	259 8 22	0.15	0.80	0.01
30	6740	−0.1337	1.4550	0.0279	0.16479	204 45 49	+0.07	0.82	0.02
May 10	6750	+0.0118	1.4491	0.0313	0.16123	270 28 55	−0.01	0.84	0.02
20	6760	0.1572	1.4291	0.0344	0.15782	276 17 34	0.09	0.85	0.02
30	6770	0.3010	1.3949	0.0371	0.15460	282 11 36	0.18	0.85	0.02
June 9	6780	0.4418	1.3465	0.0395	0.15162	288 10 43	0.27	0.84	0.02
19	6790	0.5780	1.2842	0.0415	0.14891	294 14 34	0.36	0.81	0.03
29	6800	0.7081	1.2084	0.0430	0.14652	300 22 44	0.45	0.77	0.03
July 9	6810	0.8306	1.1196	0.0441	0.14448	306 34 41	0.54	0.73	0.03
19	6820	0.9440	1.0185	0.0447	0.14282	312 49 48	0.62	0.67	0.03
29	6830	1.0470	0.9062	0.0448	0.14158	319 7 26	0.69	0.60	0.03
Aug. 8	6840	1.1384	0.7838	0.0444	0.14077	325 26 52	0.76	0.52	0.03
18	6850	1.2170	0.6527	0.0435	0.14041	331 47 19	0.81	0.44	0.03
28	6860	1.2820	0.5143	0.0421	0.14049	338 8 0	0.86	0.34	0.03
Sept. 7	6870	1.3327	0.3701	0.0402	0.14104	344 28 9	0.89	0.25	0.03
17	6880	1.3684	0.2218	0.0379	0.14202	350 46 57	0.91	0.15	0.03
27	6890	1.3890	−0.0710	0.0352	0.14343	357 3 40	0.91	+0.05	0.02
Oct. 7	6900	1.3944	+0.0806	0.0321	0.14524	3 17 36	0.90	−0.05	0.02
17	6910	1.3847	0.2313	0.0286	0.14742	9 28 7	0.88	0.15	0.02
27	6920	1.3602	0.3795	0.0248	0.14994	15 34 38	0.85	0.24	0.02
Nov. 6	6930	1.3214	0.5237	0.0208	0.15276	21 36 39	0.81	0.32	0.01
16	6940	1.2690	0.6626	0.0166	0.15584	27 33 47	0.76	0.40	0.01
26	6950	1.2038	0.7948	0.0121	0.15914	33 25 43	0.71	0.47	+0.01
Dec. 6	6960	1.1267	0.9192	0.0076	0.16261	39 12 12	0.65	0.53	0.00
16	6970	1.0388	1.0347	−0.0030	0.16621	44 53 5	0.58	0.58	0.00
26	6980	0.9412	1.1406	+0.0016	0.16991	50 28 17	0.51	0.62	0.00
36	6990	+0.8350	+1.2360	+0.0062	0.17366	55 57 46	−0.44	−0.66	0.00

JUPITER.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
Jan. 0	240 6620	−1.37726	−5.13199	+0.04966	0.72541	254° 58′ 19″	+41.47	+154.55	−1.50
10	6630	1.30503	5.14750	0.04809	0.22514	255 46 5	39.37	155.29	1.45
20	6640	1.23254	5.16198	0.04651	0.72487	256 33 55	37.26	156.01	1.41
30	6650	1.15982	5.17543	0.04491	0.72460	257 21 48	35.12	156.71	1.37
Feb. 9	6660	1.08688	5.18786	0.04331	0.72433	258 9 45	32.97	157.39	1.32
19	6670	1.01372	5.19926	0.04170	0.72406	258 57 45	30.81	158.04	1.27
March 1	6680	0.94036	5.20962	0.04008	0.72378	259 45 48	28.64	158.65	1.22
11	6690	0.86681	5.21894	0.03846	0.72850	260 33 55	26.45	159.23	1.17
21	6700	0.79309	5.22721	0.03682	0.72323	261 22 6	24.25	159.79	1.13
31	6710	0.71922	5.23443	0.03518	0.72294	262 10 20	22.03	160.33	1.08
April 10	6720	0.64520	5.24060	0.03353	0.72266	262 58 39	19.80	160.83	1.03
20	6730	0.57104	5.24571	0.03186	0.72237	263 47 1	17.56	161.31	0.98
30	6740	0.49677	5.24976	0.03021	0.72208	264 35 27	15.31	161.75	0.93
May 10	6750	0.42239	5.25277	0.02854	0.72179	265 23 57	13.04	162.17	0.88
20	6760	−0.34792	−5.25471	+0.02686	0.72150	266 12 31	+10.76	+162.56	−0.83

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

JUPITER.

1877.		Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
May	30	240 6770	−0.27338	−5.25559	+0.02518	0.72121	267° 1′ 9″	+ 8.47	+162.92	−0.78
June	9	6780	0.19879	5.25540	0.02349	0.72092	267 49 51	6.17	163.24	0.73
	19	6790	0.12415	5.25414	0.02180	0.72063	268 38 37	3.86	163.53	0.68
	29	6800	−0.04949	5.25180	0.02011	0.72033	269 27 28	+ 1.54	163.79	0.63
July	9	6810	+0.02518	5.24839	0.01841	0.72003	270 16 22	− 0.79	164.01	0.58
	19	6820	0.09985	5.24391	0.01671	0.71974	271 5 20	3.13	164.21	0.53
	29	6830	0.17449	5.23835	0.01500	0.71944	271 54 22	5.48	164.38	0.47
Aug.	8	6840	0.24909	5.23171	0.01329	0.71914	272 43 27	7.84	164.51	0.42
	18	6850	0.32364	5.22399	0.01158	0.71884	273 32 37	10.20	164.61	0.36
	28	6860	0.39812	5.21520	0.00987	0.71853	274 21 51	12.57	164.68	0.31
Sept.	7	6870	0.47251	5.20533	0.00815	0.71823	275 11 9	14.95	164.71	0.26
	17	6880	0.54680	5.19438	0.00643	0.71793	276 0 30	17.34	164.71	0.20
	27	6890	0.62098	5.18234	0.00471	0.71762	276 49 56	19.73	164.68	0.15
Oct.	7	6900	0.69503	5.16923	0.00299	0.71732	277 39 27	22.13	164.61	0.10
	17	6910	0.76893	5.15504	+0.00127	0.71701	278 29 1	24.54	164.50	−0.05
	27	6920	0.84268	5.13976	−0.00045	0.71670	279 18 40	26.95	164.36	+0.01
Nov.	6	6930	0.91625	5.12341	0.00217	0.71640	280 8 23	29.36	164.19	0.07
	16	6940	0.98964	5.10598	0.00389	0.71609	280 58 10	31.78	163.98	0.13
	26	6950	1.06282	5.08748	0.00561	0.71578	281 48 2	34.20	163.74	0.18
Dec.	6	6960	1.13578	5.06791	0.00733	0.71547	282 37 58	36.63	163.45	0.24
	16	6970	1.20850	5.04726	0.00905	0.71516	283 27 59	39.06	163.13	0.29
	26	6980	1.28097	5.02554	0.01077	0.71485	284 18 4	41.49	162.77	0.35
	36	6990	+1.35316	−5.00275	−0.01248	0.71454	285 8 13	−43.92	−162.38	+0.40

SATURN.

1877.		Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
Jan.	0	240 6620	+9.05115	−3.52956	−0.30425	0.98765	338° 43′ 24″	−13.33	+5.20	+0.45
	10	6630	9.06828	3.47757	0.30580	0.98753	339 2 45	13.36	5.12	0.45
	20	6640	9.08512	3.42547	0.30734	0.98741	339 22 7	13.40	5.05	0.45
	30	6650	9.10166	3.37325	0.30887	0.98729	339 41 29	13.43	4.98	0.46
Feb.	9	6660	9.11791	3.32092	0.31039	0.98717	340 0 52	13.47	4.90	0.46
	19	6670	9.13386	3.26848	0.31190	0.98704	340 20 15	13.50	4.83	0.46
March	1	6680	9.14951	3.21594	0.31340	0.98692	340 39 39	13.54	4.75	0.46
	11	6690	9.16486	3.16329	0.31490	0.98680	340 59 4	13.57	4.68	0.47
	21	6700	9.17991	3.11054	0.31639	0.98668	341 18 30	13.61	4.61	0.47
	31	6710	9.19467	3.05768	0.31786	0.98655	341 37 56	13.64	4.54	0.47
April	10	6720	9.20914	3.00472	0.31932	0.98643	341 57 23	13.68	4.47	0.47
	20	6730	9.22330	2.95167	0.32077	0.98630	342 16 51	13.71	4.39	0.48
	30	6740	9.23716	2.89852	0.32221	0.98618	342 36 19	13.75	4.32	0.48
May	10	6750	9.25072	2.84528	0.32364	0.98605	342 55 48	13.78	4.24	0.48
	20	6760	9.26397	2.79195	0.32506	0.98592	343 15 18	13.81	4.16	0.48
	30	6770	9.27692	2.73852	0.32647	0.98579	343 34 48	13.84	4.08	0.49
June	9	6780	9.28957	2.68500	0.32787	0.98567	343 54 19	13.87	4.00	0.49
	19	6790	9.30191	2.63139	0.32926	0.98554	344 13 51	13.90	3.93	0.49
	29	6800	9.31395	2.57769	0.33063	0.98542	344 33 23	13.93	3.85	0.49
July	9	6810	9.32568	2.52391	0.33200	0.98529	344 52 56	13.96	3.78	0.50
	19	6820	9.33710	2.47005	0.33336	0.98516	345 12 30	13.99	3.70	0.50
	29	6830	+9.34822	−2.41610	−0.33470	0.98503	345 32 5	−14.02	+3.62	+0.50

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

SATURN.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
Aug. 8	240 6840	+9.35903	−2.36207	−0.33603	0.98490	345° 51′ 40	−14.05	+3.54	+0.50
18	6850	9.36954	2.30796	0.33735	0.98478	346 11 16	14.08	3.47	0.51
28	6860	9.37974	2.25378	0.33866	0.98465	346 30 53	14.11	3.39	0.51
Sept. 7	6870	9.38963	2.19952	0.33996	0.98452	346 50 30	14.13	3.31	0.51
17	6880	9.39920	2.14519	0.34125	0.98439	347 10 8	14.16	3.23	0.51
27	6890	9.40847	2.09079	0.34253	0.98426	347 29 47	14.18	3.15	0.52
Oct. 7	6900	9.41743	2.03632	0.34380	0.98413	347 49 27	14.21	3.07	0.52
17	6910	9.42607	1.98178	0.34505	0.98400	348 9 7	14.23	2.99	0.52
27	6920	9.43440	1.92717	0.34629	0.98387	348 28 48	14.26	2.91	0.52
Nov. 6	6930	9.44241	1.87250	0.34752	0.98374	348 48 30	14.29	2.83	0.53
16	6940	9.45011	1.81777	0.34874	0.98361	349 8 12	14.32	2.75	0.53
26	6950	9.45750	1.76297	0.34994	0.98348	349 27 55	14.34	2.67	0.53
Dec. 6	6960	9.46457	1.70811	0.35114	0.98335	349 47 39	14.36	2.59	0.53
16	6970	9.47133	1.65320	0.35232	0.98322	350 7 24	14.38	2.51	0.53
26	6980	9.47777	1.59823	0.35349	0.98309	350 27 9	14.40	2.43	0.54
36	6990	+9.48389	−1.54321	−0.35466	0.98296	350 46 55	−14.42	+2.35	+0.54

URANUS.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$
	240 6600	−14.43973	+12.35251	+0.23038	1.26406	141° 49′ 38″	+0.45	−0.35	−0.01
Jan. 20	6640	14.53660	11.22054	0.23113	1.26399	142 20 16	0.45	0.34	0.01
Mar. 1	6680	14.63336	11.08827	0.23189	1.26391	142 50 56	0.45	0.34	0.01
Apr. 10	6720	14.72899	11.95519	0.23262	1.26382	142 21 37	0.46	0.34	0.01
May 20	6760	14.82350	11.82129	0.23331	1.26374	142 52 19	0.46	0.33	0.01
June 29	6800	14.91688	11.68657	0.23399	1.26367	142 23 1	0.46	0.33	0.01
Aug. 8	6840	15.00911	11.55104	0.23465	1.26359	142 53 43	0.46	0.32	0.01
Sept. 17	6880	15.10021	11.41468	0.23530	1.26352	142 24 26	0.47	0.32	0.01
Oct. 27	6920	15.19015	11.27754	0.23593	1.26344	142 55 10	0.47	0.32	0.01
Dec. 6	6960	15.27890	11.13965	0.23654	1.26337	142 25 54	0.47	0.31	0.01
Jan. 15	7000	−15.36643	+11.00099	+0.23714	1.26330	142 56 38	+0.47	−0.31	−0.01

NEPTUNE.

1877.	Julian Day.	x.	y.	z.	Log Radius Vector.	Longitude in Orbit.	$-\frac{k^2}{r^3}x$.	$-\frac{k^2}{r^3}y$.	$-\frac{k^2}{r^3}z$.
	240 6600	+24.6741	+16.7123	−0.9217	1.47444	34° 6′ 49″	−0.23	−0.16	+0.01
Jan. 20	6640	24.6030	16.8169	0.9221	1.47444	34 21 24	0.23	0.16	0.01
Mar. 1	6680	24.5314	16.9212	0.9225	1.47444	34 35 59	0.23	0.16	0.01
Apr. 10	6720	24.4594	17.0252	0.9229	1.47444	34 50 34	0.23	0.16	0.01
May 20	6760	24.3870	17.1289	0.9233	1.47445	35 5 9	0.23	0.16	0.01
June 29	6800	24.3142	17.2323	0.9236	1.47445	35 19 44	0.23	0.16	0.01
Aug. 8	6840	24.2409	17.3354	0.9240	1.47445	35 34 19	0.23	0.16	0.01
Sept. 17	6880	24.1672	17.4382	0.9243	1.47445	35 48 55	0.23	0.16	0.01
Oct. 27	6920	24.0 30	17.5407	0.9246	1.47445	36 3 30	0.23	0.17	0.01
Dec. 6	6960	24.0184	17.6430	0.9249	1.47445	36 18 6	0.23	0.17	0.01
46	7000	+23.9433	+17.7450	−0.9252	1.47446	36 32 42	−0.23	−0.17	+0.01

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

INCLINATIONS AND NODES.

Planet.	Inclination.	Increase in 100 Days.		Longitude of Ascending Node.	Increase in 100 Days.	
	ι	$\Delta\iota$	$\Delta'\iota$	Ω	$\Delta\Omega$	$\Delta'\Omega$
	° ″	″	″	° ′ ″	″	″
Mercury . .	7 0 9.8	+0.01947	−0.05777	46 49 3.1	+11.644	−1.271
Venus . . .	3 23 35.9	+0.01514	−0.00772	75 32 6.8	8.904	−2.705
Mars . . .	1 51 1.8	−0.00586	−0.07991	48 34 1.9	7.585	−2.905
Jupiter . .	1 18 35.4	−0.06189	−0.02747	99 7 15.4	9.397	+1.075
Saturn . . .	2 29 19.9	−0.03825	+0.02400	112 30 53.2	8.398	−2.760
Uranus . .	0 46 21.1	+0.00688	−0.01613	73 21 7.0	5.080	+0.885
Neptune . .	1 46 54.7	−0.09020	+0.00364	130 22 29.7	+10.885	−0.031

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

$\Delta\iota$ and $\Delta\Omega$ refer to the moving ecliptic and equinox.
$\Delta'\iota$ and $\Delta'\Omega$ refer to the ecliptic and equinox of the epoch.

MASSES. Sun's = 1.

Planet.	Mass.	Log. of Mass.	Authority.
Mercury . .	$\frac{1}{4865751}$ =.000 000 206	93.31285	Encke, *A. N.*, No. 443.
Venus . . .	$\frac{1}{390000}$ =.000 002 564	94.40893	Le Verrier, *Théor. de Merc.*, p. 115.
The Earth .	$\frac{1}{354936}$ =.000 002 817	94.44985	Le Verrier, *Théor. de Merc.*, p. 26.
Mars . . .	$\frac{1}{2680637}$ =.000 000 373	93.57176	Burckhardt, *Conn. des Temps.*, 1816, p. 343.
Jupiter . .	$\frac{1}{1047.879 \pm .235}$ =.000 954 308	96.979689	Bessel, *Die Masse des Jupiter*, p. 64.
Saturn . . .	$\frac{1}{3501.6}$ =.000 285 584	96.455733	Bessel, *Comptes Rendus*, 1841.
Uranus . .	$\frac{1}{24905}$ =.000 040 153	95.60371	Lamont, *Mem. Ast. Soc.*, Vol. XI. p. 54.
Neptune . .	$\frac{1}{18780}$ =.000 053 248	95.72630	Peirce, *Am. Ac. Proc.*, Vol. 1. p. 333.

ECLIPSES IN 1877.

In the year 1877 there will be five Eclipses, three of the Sun and two of the Moon.

I. A Total Eclipse of the Moon, February 26–27, 1877, invisible at Washington, with the following elements:

Washington mean time of ☍ in Right Ascension, February 27^{d} 2^{h} 0^{m} 59^{s}.3.

Sun's Right Ascension	22^{h} 43^{m} 42^{s}.38	Hourly Motion	9^{s}.39
Moon's Right Ascension	10 43 42.38	" "	134.46
Sun's Declination	−8° 4′ 14″.7	Hourly Motion	+ 0′ 56″.6
Moon's Declination	+8 12 0.3	" "	−17 14.4
Sun's Equa. Hor. Par.	8.9	True Semidiameter	16 8.5
Moon's Equa. Hor. Par.	60 47.9	" "	16 33.2

From these elements may be deduced the following results:—

Moon enters Penumbra February	26^{d} 23^{h} 25^{m}.0	Washington mean time.
Moon enters Shadow	27 0 21.2	" "
Total Eclipse begins	27 1 18.7	" "
Middle of Eclipse	27 2 7.2	" "
Total Eclipse ends	27 2 55.6	" "
Moon leaves Shadow	27 3 53.2	" "
Moon leaves Penumbra	27 4 48.8	" "

First contact of Shadow with Moon's limb 124° from the north point towards the East, when the Moon is in the zenith, in longitude 177° 3′ East from Washington, and in latitude 8° 40′ North.

Last contact of Shadow with Moon's limb 69° from the north point towards the West, when the Moon is in the zenith, in longitude 125° 53′ East from Washington, and in latitude 7° 40′ North.

Magnitude of the Eclipse = 1.671 (Moon's diameter = 1).

II. A Partial Eclipse of the Sun, March 14, 1877, invisible at Washington, with the following elements:

Washington mean time of ☌ in Right Ascension, March 14^{d} 10^{h} 59^{m} 12^{s}.0.

Sun and Moon's R. A.	23^{h} 40^{m} 35^{s}.28	Hourly Motions	9^{s}.14 and 108^{s}.56
Sun's Declination	−2° 6′ 8″.6	Hourly Motion	+ 0′ 59″.2
Moon's Declination	−0 38 46.0	" "	+14 43.2
Sun's Equa. Hor. Par.	8.9	True Semidiameter	16 4.5
Moon's Equa. Hor. Par.	55 4.1	" "	15 59.6

From these elements may be deduced the following results:—

Eclipse begins on the Earth March 14^d^ 8^h^ 7^m^.0, Washington mean time, in longitude 151° 58′.6 East from Washington, and in latitude 34° 7′.2 North.

Greatest Eclipse 9^h^ 30^m^.0, in longitude 133° 38′.5 East from Washington, and in latitude 61° 4′.1 North

Eclipse ends on the Earth 10^h^ 52^m^.1, in longitude 156° 23′.5 East from Washington, and in latitude 87° 8′.7 North.

Magnitude of the Greatest Eclipse = 0.298 (Sun's diameter = 1).

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

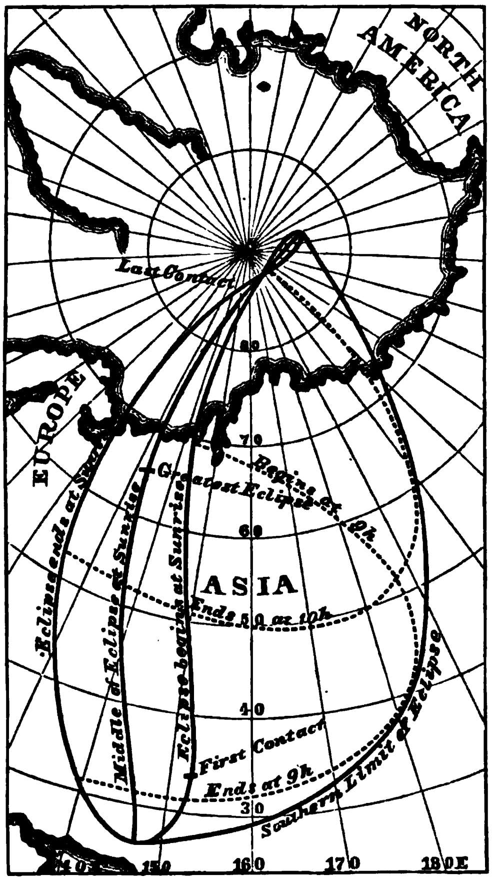
Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.99	9.99	−8.6	−8.5	° ′ ″
8 0	−1.35077	+1.41069	+0.27917	9616	9770	2609	1695	117 42 36.4
8 10	1.27545	1.45231	0.32079	9617	9771	2563	1634	120 12 38.8
8 20	1.20012	1.49393	0.36241	9618	9771	2516	1573	122 42 41.3
8 30	1.12478	1.53554	0.40404	9619	9772	2469	1512	125 12 43.7
8 40	1.04943	1.57716	0.44567	9619	9773	2421	1451	127 42 46.2
8 50	0.97407	1.61878	0.48730	9620	9773	2373	1390	130 12 48.6
9 0	0.89871	1.66039	0.52893	9621	9774	2324	1329	132 42 51.1
9 10	0.82334	1.70201	0.57056	9622	9775	2277	1267	135 12 53.5
9 20	0.74796	1.74363	0.61219	9623	9776	2229	1206	137 42 56.0
9 30	0.67258	1.78524	0.65383	9624	9776	2181	1144	140 12 58.4
9 40	0.59719	1.82686	0.69546	9624	9777	2134	1083	142 43 0.9
9 50	0.52180	1.86848	0.73710	9625	9777	2086	1021	145 13 3.3
10 0	0.44640	1.91010	0.77874	9626	9778	2038	0959	147 43 5.8
10 10	0.37100	1.95172	0.82037	9627	9778	1990	0897	150 13 8.2
10 20	0.29560	1.99334	0.86201	9628	9779	1942	0835	152 43 10.7
10 30	0.22020	2.03495	0.90365	9629	9779	1894	0773	155 13 13.1
10 40	0.14480	2.07657	0.94529	9629	9780	1846	0711	157 43 15.5
10 50	−0.06939	2.11819	0.98693	9630	9781	1798	0640	160 13 18.0
11 0	+0.00602	+2.15981	+1.02857	9631	9782	1750	0587	162 43 20.4

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

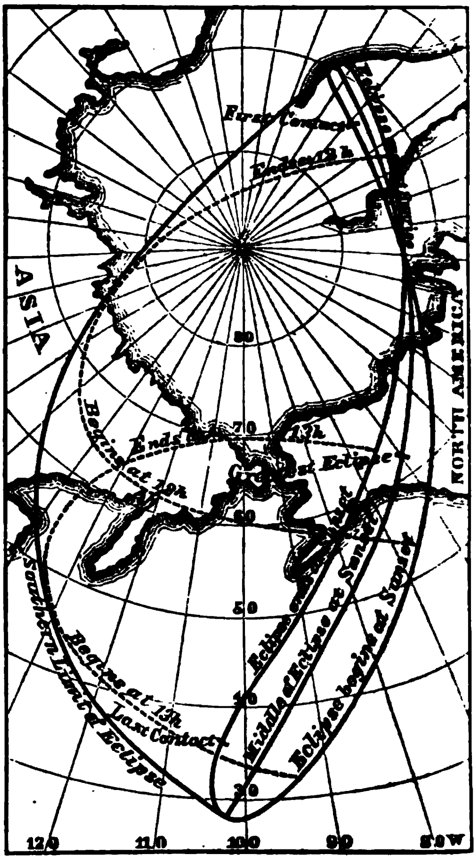
Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A′.	B′.	C′.
h m						
8 0	+7531.3	+4161.7	+4162.2	+125.52	+69.36	+69.37
8 30	7534.3	4161.7	4162.7	125.57	69.36	69.38
9 0	7536.7	4161.7	4163.1	125.61	69.36	69.38
9 30	7538.5	4161.8	4163.5	125.64	69.36	69.39
10 0	7539.7	4161.8	4163.7	125.66	69.36	69.39
10 30	7540.3	4161.8	4163.8	125.67	69.36	69.40
11 0	+7540.3	+4161.8	+4163.8	+125.67	+69.36	+69.40

OUTLINES AND PATH OF THE PENUMBRA OF THE PARTIAL ECLIPSE OF

MARCH 14, 1877.



AUGUST 8, 1877.



III. A Partial Eclipse of the Sun, August 8, 1877, invisible at Washington, with the following elements:

Washington mean time of ☌ in Right Ascension, August $8^{d}\ 11^{h}\ 24^{m}\ 14^{s}.1$.

Sun and Moon's R. A.	$9^{h}\ 16^{m}\ 23^{s}.24$	Hourly Motions	$9^{s}.52$ and $147^{s}.52$
Sun's Declination	$+15^{\circ}\ 51'\ 41''.3$	Hourly Motion	$-\ 0'\ 43''.3$
Moon's Declination	+17 19 56.6	" "	−14 39.1
Sun's Equa. Hor. Par.	8.7	True Semidiameter	15 47.1
Moon's Equa Hor. Por.	61 20.6	" "	16 42.1

From these elements may be deduced the following results:—

Eclipse begins on the Earth August $8^{d}\ 11^{h}\ 4^{m}.4$, Washington mean time, in longitude 38° 23′.5 East from Washington, and in latitude 72° 56′.0 North.

Greatest Eclipse $12^{h}\ 22^{m}.0$, in longitude 61° 21′.6 West from Washington, and in latitude 62° 21′.6 North.

Eclipse ends on the Earth $13^{h}\ 40^{m}.0$, in longitude 101° 58′.2 West from Washington, and in latitude 35° 48′.2 North.

Magnitude of the Greatest Eclipse = 0.394 (Sun's diameter = 1.)

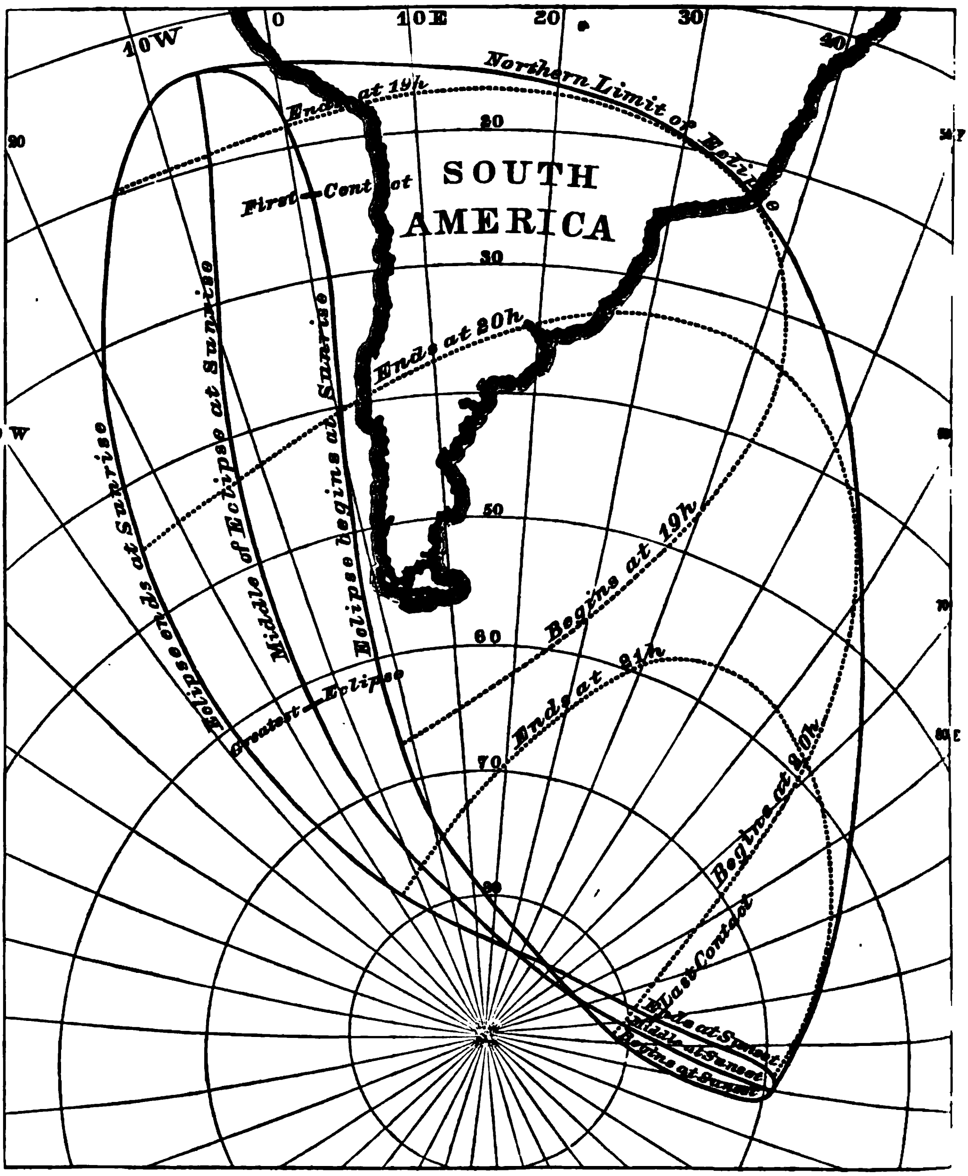
DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A	B	C	log E.	log F.	log G.	log H.	μ
h m				9.98	9.98	+9.42	+9.44	° ′ ″
11 0	−0.21739	+2.06478	+1.00330	3708	2569	9579	3683	163 40 45.7
11 10	0.12768	2.02686	0.96537	3712	2573	9527	3633	166 10 47.4
11 20	−0.03798	1.98893	0.92743	3716	2578	9475	3583	168 40 49.0
11 30	+0.05172	1.95098	0.88948	3720	2582	9423	3532	171 10 50.7
11 40	0.14141	1.91301	0.85151	3724	2586	9371	3482	173 40 52.4
11 50	0.23110	1.87503	0.81353	3728	2590	9319	3432	176 10 54.1
12 0	0.32078	1.83703	0.77553	3732	2594	9268	3382	178 40 55.8
12 10	0.41046	1.79902	0.73752	3736	2599	9216	3332	181 10 57.4
12 20	0.50013	1.76100	0.69950	3740	2603	9164	3282	183 40 59.1
12 30	0.58980	1.72297	0.66148	3744	2607	9112	3231	186 11 0.8
12 40	0.67946	1.68493	0.62345	3748	2611	9059	3181	188 41 2.5
12 50	0.76912	1.64688	0.58541	3752	2615	9007	3131	191 11 4.2
13 0	0.85878	1.60883	0.54737	3756	2620	8955	3081	193 41 5.9
13 10	0.94843	1.57077	0.50933	3760	2624	8903	3031	196 11 7.5
13 20	1.03807	1.53271	0.47128	3765	2628	8851	2980	198 41 9.2
13 30	1.12771	1.49465	0.43323	3769	2632	8799	2930	201 11 10.9
13 40	+1.21734	+1.45659	+0.39519	3763	2636	8747	2880	203 41 12.6

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

Washington Mean Time.	For one Minute.			For one Second.		
	A	B	C	A′	B′	C′
h m						
11 0	+8970.8	−3790.4	−3791.3	+149.51	−63.17	−63.19
11 30	8969.5	3795.8	3796.2	149.49	63.26	63.27
12 0	8968.1	3800.1	3800.0	149.47	63.33	63.33
12 30	8966.7	3803.3	3802.7	149.45	63.39	63.38
13 0	8965.2	3805.4	3804.3	149.42	63.42	63.40
13 30	8963.5	3806.3	3804.7	149.39	63.44	63.41
14 0	+8961.7	−3806.1	−3804.0	+149.36	−63.43	−63.40

OUTLINES AND PATH OF THE PENUMBRA OF THE PARTIAL ECLIPSE OF SEPTEMBER 6, 1877.



IV. A Total Eclipse of the Moon, August 23, 1877, partly visible at Washington, with the following elements:

Washington mean time of ☍ in Right Ascension, August $23^{d}\ 5^{h}\ 58^{m}\ 46^{s}.3$.

	h m s		s
Sun's Right Ascension	10 11 37.35	Hourly motion	9.19
Moon's Right Ascension	22 11 37.35	" "	108.58
	° ′ ″		′ ″
Sun's declination	+11 10 46.8	Hourly motion	− 0 51.3
Moon's declination	−11 15 15.7	" "	+13 0.7
Sun's Equa. Hor. Par.	8.8	True Semidiameter	15 49.8
Moon's Equa. Hor. Par.	53 59.8	" "	14 42.1

From these elements may be deduced the following results:

		d	h	m	
Moon enters Penumbra	August	23	3	6.0	Washington mean time.
Moon enters Shadow		23	4	11.1	" "
Total Eclipse begins		23	5	11.7	" "
Middle of Eclipse		23	6	1.5	" "
Total Eclipse ends		23	6	51.3	" "
Moon leaves Shadow		23	7	51.8	" "
Moon leaves Penumbra		23	8	57.0	" "

First contact of Shadow with Moon's limb 55° from the north point towards the East, when the Moon is in the zenith, in longitude 117° 3′ East from Washington, and in latitude 11° 38′ South.

Last contact of Shadow with Moon's limb 122° from the north point towards the West, when the Moon is in the zenith, in longitude 63° 23′ East from Washington, and in latitude 10° 51′ South.

Magnitude of the Eclipse = 1.761 (Moon's diameter = 1).

V. A Partial Eclipse of the Sun, September 6, 1877, invisible at Washington, with the following elements:

Washington mean time of ☌ in Right Ascension, September $6^{d}\ 20^{h}\ 46^{m}\ 39^{s}.8$.

	h m s		s s
Sun and Moon's R. A.	11 4 46.43	Hourly Motions	9.02 and 134.47
	° ′ ″		′ ″
Sun's Declination	+5 54 43.8	Hourly Motion	− 0 56.3
Moon's Declination	+4 31 43.6	" "	−17 43.2
Sun's Equa. Hor. Par.	8.8	True Semidiameter	15 53.0
Moon's Equa. Hor. Par.	61 9.7	" "	16 39.2

From these elements may be deduced the following results:—

Eclipse begins on the Earth September $6^{d}\ 18^{h}\ 1^{m}.7$, Washington mean time, in longitude 1° 33′.7 East from Washington, and in latitude 23° 12′.2 South.

Greatest Eclipse $19^{h}\ 40^{m}.4$, in longitude 14° 43′.6 West from Washington, and in latitude 61° 14′.4 South.

Eclipse ends on the Earth $21^{h}\ 18^{m}.4$, in longitude 100° 5′.0 East from Washington, and in latitude 78° 18′3 South.

Magnitude of the Greatest Eclipse = 0.644 (Sun's diameter = 1).

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.99	9.99	+8.99	+9.03	° ′ ″
18 0	−1.42350	−0.06267	−1.12879	7859	7438	6364	5036	270 32 21.7
18 10	1.33810	0.10855	1.17469	7861	7440	6173	4862	273 2 24.6
18 20	1.25270	0.15442	1.22059	7862	7442	5983	4688	275 32 27.4
18 30	1.16729	0.20029	1.26649	7864	7444	5793	4515	278 2 30.3
18 40	1.08188	0.24616	1.31238	7866	7446	5602	4341	280 32 33.1
18 50	0.99647	0.29203	1.35827	7868	7448	5412	4167	283 2 36.0
19 0	0.91106	0.33790	1.40416	7870	7450	5221	3993	285 32 38.9
19 10	0.82565	0.38377	1.45004	7872	7452	5031	3819	288 2 41.7
19 20	0.74023	0.42964	1.49592	7874	7454	4840	3645	290 32 44.6
19 30	0.65481	0.47550	1.54180	7876	7456	4649	3471	293 2 47.4
19 40	0.56940	0.52137	1.58768	7878	7459	4458	3297	295 32 50.3
19 50	0.48398	0.56723	1.63356	7879	7461	4268	3122	298 2 53.2
20 0	0.39856	0.61309	1.67943	7881	7463	4077	2948	300 32 56.1
20 10	0.31315	0.65896	1.72531	7883	7465	3886	2773	303 2 58.9
20 20	0.22773	0.70482	1.77118	7885	7467	3695	2599	305 33 1.8
20 30	0.14231	0.75068	1.81705	7887	7469	3503	2424	308 3 4.7
20 40	−0.05690	0.79655	1.86292	7889	7471	3312	2250	310 33 7.5
20 50	+0.02851	0.84241	1.90879	7891	7473	3121	2075	313 3 10.4
21 0	0.11392	0.88827	1.95465	7893	7475	2929	1900	315 33 13.2
21 10	0.19933	0.93413	2.00051	7894	7477	2738	1726	318 3 16.1
21 20	+0.28474	−0.97999	−2.04637	7896	7479	2547	1551	320 33 18.9

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A′.	B′.	C′.
h m						
18 0	+8539.8	−4587.6	−4590.7	+142.33	−76.46	−76.51
18 30	8540.7	4587.2	4589.5	142.34	76.45	76.49
19 0	8541.4	4586.9	4588.5	142.36	76.45	76.47
19 30	8541.7	4586.5	4587.8	142.36	76.44	76.46
20 0	8541.7	4586.4	4587.4	142.36	76.44	76.46
20 30	8541.3	4586.3	4587.0	142.35	76.44	76.45
21 0	8540.8	4586.0	4586.3	142.35	76.43	76.44
21 30	+8540.3	−4585.7	−4585.3	+142.34	−76.43	−76.42

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JANUARY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
80 Cancri	6½	+1.67	-1.2	+18 32.8	1 9 33.5	- 4 44.2	+0.7441	.5752	-.2227	+90	+ 3
83 Cancri	6	1.64	1.4	18 13.5	12 25.8	- 1 58.4	+0.4139	.5722	.2281	+70	-15
8 Leonis	6½	1.57	2.2	16 59.4	19 55.4	+ 5 14.2	-0.1276	.5646	.2412	+38	-44
Uranus				14 10.2	2 3 3.2	-11 53.7	+0.9103	.5619	.2541	+90	+ 9
α Leonis	1½	1.39	2.9	12 34.0	9 26.4	- 5 44.1	+0.8674	.5516	.2596	+90	+ 5
34 Leonis	6	+1.39	-3.4	+13 57.6	10 50.8	- 4 22.7	-0.8835	.5504	-.2612	- 3	-76
45 Leonis	6	1.27	3.5	10 23.2	18 1.4	+ 2 32.9	+0.7766	.5441	.2681	+90	- 1
ρ Leonis	4	1.25	3.6	9 56.2	20 21.8	+ 4 48.4	+0.5965	.5422	.2700	+82	-11
49 Leonis, *mult.*	6	1.24	3.5	9 17.0	21 23.0	+ 5 47.6	+0.9748	.5413	.2709	+90	+10
c Leonis	5	1.09	4.0	6 45.6	3 9 17.6	- 6 41.6	+0.2392	.5325	.2777	+57	-32
τ Leonis	5	+0.92	-4.1	+ 3 31.9	22 15.6	+ 5 51.3	-0.1255	.5249	-.2811	+38	-51
59 Leonis	6	0.90	4.5	+ 3 44.5	4 1 23.2	+ 8 53.0	-0.2193	.5234	.2813	-24	-86
B. A. C. 4200	6	0.56	4.1	- 3 56.1	5 3 47.8	+10 28.4	-0.7296	.5149	.2742	+ 7	-90
B. A. C. 4225	6½	0.54	4.1	4 22.5	5 41.0	-11 41.7	-0.7920	.5149	.2731	+ 3	-90
f Virginis	6	0.50	3.9	5 9.4	8 15.6	- 9 12.0	-0.6849	.5146	.2716	+ 8	-90
χ Virginis	5	+0.47	-3.2	- 7 19.1	9 29.2	- 8 0.6	+1.2266	.5145	-.2709	+83	+25
B. A. C. 4259	6	0.47	3.2	7 21.4	9 33.2	- 7 56.7	+1.2477	.5145	.2708	+83	+27
28 Virginis	6	0.46	3.5	6 49.5	10 50.5	- 6 41.8	+0.3480	.5142	.2669	+63	-27
ψ Virginis	5	0.38	3.4	8 52.3	17 2.4	- 0 41.3	+0.8219	.5444	.2653	+81	- 1
g Virginis	6	0.30	3.3	10 5.0	23 48.7	+ 5 52.7	+0.3138	.5145	.2595	+59	-28
50 Virginis	6	+0.29	-3.6	- 9 40.5	6 0 44.8	+ 6 47.3	-0.3578	.5145	-.2586	+24	-65
58 Virginis	6	0.26	3.9	9 54.0	4 36.0	+10 31.3	-1.1112	.5150	.2547	-20	-90
i Virginis	5	0.19	3.3	12 4.1	9 12.4	- 9 0.7	+0.0041	.5156	.2500	+41	-44
B. A. C. 4531	6	0.14	3.2	12 35.1	13 9.2	- 5 11.2	-0.4307	.5163	.2456	+19	-70
85 Virginis	6	+0.06	2.9	15 9.1	18 31.9	+ 0 1.5	+0.9815	.5175	.2391	+75	+ 9
B. A. C. 4700	6	-0.06	-3.6	-15 43.3	7 6 55.5	-11 58.0	-1.2685	.5210	-.2224	-39	-90
B. A. C. 4722	6	0.10	3.1	17 37.6	9 7.8	- 9 49.8	+0.2656	.5217	.2191	+51	-30
B. A. C. 4739	6	0.11	3.0	18 8.7	10 40.2	- 8 20.4	+0.4826	.5217	.2192	+62	-19
B. A. C. 4923	6	0.31	3.5	20 51.5	8 5 10.4	+ 9 34.4	-0.3340	.5295	.1857	+16	-65
B. A. C. 5023	6	0.40	3.9	21 56.7	14 6.9	- 5 46.5	-0.7490	.5333	.1686	- 8	-90
42 Libræ	5½	-0.50	-4.3	-23 25.1	9 1 8.7	+ 4 53.2	-0.8935	.5379	-.1460	-19	-90
B. A. C. 5197	6	0.53	4.0	24 19.7	3 40.6	+ 7 20.1	-0.2650	.5389	.1406	+14	-60
b Scorpii	5	0.55	4.0	25 22.6	5 59.8	+ 9 34.5	+0.7369	.5398	.1355	+58	-13
A^2 Scorp., *mult.*	5	0.57	4.1	24 57.6	7 12.4	+10 44.7	-0.0611	.5403	.1328	+24	-48
B. A. C. 5253	6	0.56	4.5	24 9.9	7 21.2	+10 53.3	-0.9445	.5404	.1324	-24	-90
B. A. C. 5255	6	-0.57	-4.1	-25 2.7	7 28.6	+11 0.4	-0.0042	.5404	-.1322	+27	-45
3 Scorpii	6	0.57	4.3	24 52.8	7 41.1	+11 12.5	-0.2115	.5405	.1317	+16	-57
4 Scorpii	6	0.59	4.1	25 54.3	8 2.8	+11 33.5	+0.8576	.5407	.1308	+64	+ 5
B. A. C. 5286	6½	0.59	4.6	24 29.1	9 28.6	-11 3.6	-0.8746	.5412	.1277	-20	-90
π Scorpii	3	0.60	4.3	25 45.6	9 34.2	-10 58.3	+0.5035	.5412	.1275	+54	-16
B. A. C. 5314	6	-0.61	-4.5	-25 31.4	11 36.9	- 8 59.7	-0.0100	.5420	-.1227	+25	-45
B. A. C. 5347	5	0.62	4.5	25 59.8	13 45.3	- 6 55.7	+0.2502	.5427	.1176	+39	-31
σ Scorpii	3½	0.65	5.2	25 17.8	19 39.5	- 1 13.7	-1.1714	.5447	.1040	-44	-90
α Scorpii	1½	0.69	5.2	26 9.5	23 19.2	+ 2 18.4	-0.5943	.5460	.0951	- 7	-87
τ Scorpii	3½	0.72	5.0	27 57.6	10 2 9.8	+ 5 3.2	+1.1179	.5468	.0884	+62	+26
B. A. C. 5603	6½	-0.73	-5.1	-28 16.8	6 12.8	+ 8 57.8	+1.1319	.5478	-.0785	+62	+28
B. A. C. 5800	6½	0.79	6.5	26 50.2	19 11.2	- 2 30.9	-1.2598	.5502	.0457	-60	-90
43 Ophiuchi	6	0.82	6.5	28 1.3	23 10.8	+ 1 20.3	-0.1170	.5507	.0354	+11	-51
3 Sagittarii	5	0.83	7.3	27 47.0	11 9 51.1	+11 38.2	-0.6116	.5510	-.0078	-16	-90
B. A. C. 6063	6½	0.85	7.5	28 2.8	13 53.0	- 8 28.4	-0.3304	.5507	+.0026	- 2	-65
B. A. C. 6072	6½	0.86	7.4	28 44.5	14 43.2	- 7 39.9	+0.4398	.5507	.0049	+39	-19
B. A. C. 6120	6½	-0.87	-7.7	-28 22.3	18 19.6	- 4 11.1	+0.0658	.5503	+.0142	+19	-41
B. A. C. 6127	5	0.87	7.7	28 28.2	18 53.9	- 3 38.1	+0.1835	.5502	.0155	+25	-34
B. A. C. 6190	6½	0.88	7.9	28 41.5	23 1.2	+ 0 20.6	+0.5152	.5496	.0263	+46	-15
B. A. C. 6191	6½	0.88	8.0	28 19.6	23 1.6	+ 0 21.0	+0.1104	.5496	.0263	+22	-38
B. A. C. 6194	5½	0.86	8.2	27 5.3	23 21.7	+ 0 40.4	-1.2523	.5495	.0271	-59	-90
B. A. C. 6220	6½	-0.87	-8.1	-28 29.3	12 1 4.6	+ 2 29.7	+0.3495	.5492	+.0314	+36	-25

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JANUARY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	°	d h m	h m				°	°
ι Capricorni	4½	−0.60	− 9.0	−17 21.4	**15** 15 13.1	−10 18.8	−1.0120	.5091	+.2064	−18	−90
γ Capricorni	3½	0.55	8.7	17 13.1	**16** 0 35.3	− 1 12.9	+0.8224	.5034	.2182	+73	0
44 Capricorni	6	0.56	8.4	14 51.8	2 13.4	+ 0 22.4	−1.3234	.5026	.2202	−44	−90
45 Capricorni	6	0.55	8.4	15 19.0	2 43.2	+ 0 51.4	−0.8213	.5024	.2207	− 5	−90
δ Capricorni	3	0.52	8.5	16 41.2	4 17.3	+ 2 22.9	+1.0457	.5016	.2225	+74	+13
μ Capricorni	5	−0.52	− 8.0	−14 7.9	7 40.5	+ 5 40.2	−1.0292	.5000	+.2262	−17	−90
ι Aquarii	4	0.50	7.8	14 28.1	14 47.4	−11 25.0	+0.9793	.4969	.2334	+76	+ 9
e^2 Aquarii	6	0.48	7.3	10 10.2	17 6.1	− 9 10.2	−1.0238	.4960	.2356	−15	−90
42 Aquarii	6	0.45	7.4	13 26.7	20 27.6	− 5 54.3	+1.1844	.4947	.2386	+77	+24
σ Aquarii	4½	0.41	6.6	11 18.5	**17** 4 6.4	+ 1 31.8	+0.6680	.4921	.2448	+79	−10
58 Aquarii	6	−0.41	− 6.5	−11 32.2	4 40.6	+ 2 5.0	+1.0600	.4920	+.2453	+79	+14
64 Aquarii	6½	0.38	6.2	10 40.1	8 54.0	+ 6 11.5	+1.1426	.4908	.2483	+80	+19
λ Aquarii	4	0.35	5.4	8 14.1	16 21.3	−10 33.3	+0.3255	.4890	.2530	+61	−28
78 Aquarii	6	0.35	5.3	7 51.5	17 27.4	− 9 29.1	+0.1889	.4888	.2536	+53	−35
81 Aquarii	6	0.32	5.0	7 43.2	21 16.8	− 5 45.8	+1.0111	.4882	.2556	+83	+10
82 Aquarii	6	−0.32	− 4.9	− 7 14.0	21 55.5	− 5 8.2	+0.6402	.4881	+.2560	+81	−12
B. A. C. 8094	6	0.27	3.4	4 10.0	**18** 5 15.8	+ 2 0.3	−0.8431	.4872	.2591	0	−90
B. A. C. 8134	6½	0.25	3.7	5 20.8	8 30.7	+ 5 9.9	+1.2963	.4870	.2603	+85	+32
11 Piscium	6½	0.25	2.6	2 28.1	13 4.5	+ 9 36.4	−0.6697	.4869	.2617	+10	−88
14 Piscium	6½	0.23	2.3	− 1 55.6	15 42.4	−11 50.0	−0.5716	.4869	.2623	+15	−79
21 Piscium	6	−0.18	− 1.1	+ 0 23.5	**19** 0 18.5	− 3 27.9	−0.8412	.4876	+.2638	+ 1	−90
25 Piscium	6	0.17	0.7	+ 1 24.4	2 19.8	− 1 29.9	−1.4148	.4879	.2639	−48	−80
B. A. C. 8311	6½	0.14	− 1.2	− 0 34.5	3 16.7	− 0 34.5	+0.9975	.4880	.2640	+90	+ 9
51 Pisc., *mult.*	6½	−0.01	+ 2.4	+ 6 16.7	**20** 0 2.4	− 4 23.0	−0.9716	.4938	.2619	− 7	−84
60 Piscium	6	+0.07	2.8	6 4.2	8 8.7	+ 3 29.8	+1.3649	.4973	.2593	+90	+43
62 Piscium	6	+0.06	+ 3.1	+ 6 37.8	8 36.9	+ 3 57.2	+0.8837	.4976	+.2591	+90	+ 3
δ Piscium	4½	0.07	3.2	6 55.0	8 49.5	+ 4 9.4	+0.6299	.4977	.2590	+85	−11
101 Piscium	6	0.27	7.3	14 2.1	**21** 9 14.4	+ 3 51.4	−0.8236	.5132	.2437	+ 1	−76
104 Piscium	6½	0.30	7.2	13 39.8	10 59.0	+ 5 32.8	−0.0080	.5145	.2418	+44	−40
26 Arietis	6½	0.58	10.4	19 18.7	**22** 11 32.0	+ 5 18.7	−0.3503	.5370	.2022	+26	−54
B. A. C. 782	6½	+0.61	+10.0	+18 20.4	12 54.4	+ 6 38.5	+0.9541	.5383	+.2102	+90	+16
μ Arietis	5½	0.66	10.6	19 29.4	16 51.5	+10 27.5	+0.5716	.5424	.2038	+82	− 5
47 Arietis	6	0.77	11.0	20 10.6	23 48.5	− 6 50.1	+1.2277	.5497	.1917	+90	+40
ε Arietis, *mult.*	4½	0.77	11.2	20 51.0	**23** 0 18.2	− 6 21.4	+0.6240	.5502	.1907	+88	− 1
64 Arietis	6	0.94	12.5	24 17.4	10 58.3	+ 3 55.6	−1.0051	.5620	.1690	−14	−66
66 Arietis	6½	+0.95	+11.9	+22 22.9	12 44.1	+ 5 37.4	+1.2511	.5640	+.1650	+90	+46
7 Tauri, *mult.*	6	1.01	12.4	24 3.2	15 11.3	+ 7 59.1	−0.0678	.5666	.1596	+41	−32
11 Tauri	6	1.05	12.7	24 56.0	17 46.1	+10 28.2	−0.5652	.5695	.1535	+13	−59
g Pleiadum	4½	1.08	12.4	23 54.3	19 25.7	−11 56.1	+0.7389	.5713	.1494	+90	+10
b Pleiadum	4	1.08	12.3	23 43.7	19 27.7	−11 54.2	+0.9236	.5713	.1494	+90	+21
m Pleiadum	7	+1.08	+12.6	+24 27.3	19 33.8	−11 48.3	+0.1963	.5714	+.1491	+56	−18
e Pleiadum	5	1.07	12.4	24 5.0	19 35.3	−11 46.9	+0.5798	.5714	.1491	+85	+ 2
c Pleiadum	6	1.08	12.4	23 59.1	19 50.4	−11 32.3	+0.7175	.5718	.1484	+90	+ 9
d Pleiadum	5	1.08	12.2	23 34.0	20 3.1	−11 20.1	+1.1763	.5720	.1479	+90	+41
η Tauri	3	1.09	12.3	23 43.6	20 31.0	−10 53.3	+1.0812	.5725	.1467	+90	+33
f Pleiadum	4	+1.10	+12.2	+23 40.8	21 11.7	−10 14.2	+1.2283	.5732	+.1452	+90	+46
h Pleiadum	5½	1.10	12.3	23 45.8	21 12.2	−10 13.7	+1.1437	.5732	.1452	+90	+38
B. A. C. 1192	6½	1.11	12.8	25 12.5	21 37.8	− 9 49.0	−0.2715	.5737	.1440	+29	−41
p Tauri	6	1.26	12.8	26 9.8	**24** 5 45.1	− 2 1.1	−0.1589	.5822	.1225	+35	−33
φ Tauri, *mult.*	5½	1.33	12.9	27 3.6	9 25.9	+ 1 31.1	−0.6353	.5859	.1122	+ 9	−59
χ^1 Tauri	5½	1.34	12.4	25 20.4	10 19.5	+ 2 22.5	+1.2043	.5868	.1096	+90	+48
χ^2 Tauri	8½	+1.34	+12.4	+25 20.7	10 19.7	+ 2 22.7	+1.2009	.5868	+.1096	+90	+47
B. A. C. 1444	6	1.47	13.0	28 22.7	17 24.1	+ 9 9.7	−1.1636	.5934	.0887	−32	−62
B. A. C. 1648	6½	1.73	11.7	27 50.0	**25** 8 5.1	− 0 46.4	+0.3425	.6031	.0490	+66	0
B. A. C. 1649	6½	1.75	12.0	29 26.7	8 7.8	− 0 44.0	−1.2656	.6048	.0406	−52	−61
β Tauri	2	1.77	11.5	28 30.3	9 59.7	+ 1 3.1	−0.2559	.6059	.0345	+30	−31
B. A. C. 1709	6½	+1.79	+11.6	+29 5.4	11 12.4	+ 2 12.6	−0.8002	.6064	+.0303	− 2	−61

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JANUARY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 1746	6½	+1.80	+10.8	+27 35.0	25 13 29.9	+ 4 24.2	+0.7607	.6077	+.0223	+90	+24
B. A. C. 1772	6	1.86	11.1	29 8.8	14 40.8	+ 5 32.0	−0.7709	.6083	.0182	− 1	−61
136 Tauri	5	1.90	10.1	27 35.0	19 44.6	+10 22.5	+0.8290	.6104	+.0002	+90	+30
B. A. C. 1882	6½	1.94	10.2	28 55.4	20 52.2	+11 27.1	−0.5028	.6109	−.0037	+16	−43
κ Aurigæ	4½	2.04	9.4	29 32.6	26 3 33.8	− 6 9.0	−1.2196	.6126	.0276	−41	−61
B. A. C. 2097	6½	+2.10	+ 8.4	+28 17.6	8 54.8	− 1 2.1	−0.1817	.6132	−.0470	+34	−27
49 Aurigæ	5½	2.12	8.1	28 7.1	10 38.1	+ 0 36.6	−0.0994	.6132	.0532	+39	−24
53 Aurigæ	6	2.14	8.0	29 5.4	11 44.7	+ 1 40.3	−1.1133	.6132	.0570	−27	−61
54 Aurigæ	6	2.15	7.9	28 22.3	12 10.5	+ 2 4.9	−0.4308	.6131	.0584	+20	−42
28 Geminor.	6	2.17	7.6	29 5.7	14 0.7	+ 3 50.2	−1.2560	.6130	.0648	−48	−61
39 Geminor.	6½	+2.17	+ 6.4	+26 14.6	19 4.6	+ 8 40.7	+1.1752	.6122	−0.828	+90	+47
47 Geminor.	6	2.21	5.7	27 3.5	23 33.3	−11 2.4	−0.0330	.6110	.0984	+43	−24
53 Geminor.	6	2.27	5.6	28 6.7	27 1 10.3	− 9 29.7	−1.2283	.6104	.1038	−40	−62
Λ Geminorum	5½	2.23	4.8	25 17.2	3 56.3	− 6 50.9	+1.2405	.6094	.1134	+90	+52
υ Geminorum	4½	2.30	4.2	27 10.1	8 24.1	− 2 34.8	−1.1410	.6073	.1278	−28	−63
c Geminorum	6	+2.30	+ 3.4	+26 4.6	11 24.3	+ 0 17.6	−0.4703	.6057	−.1375	+18	−51
κ Gemi., *mult.*	3½	2.29	3.3	24 41.5	11 33.2	+ 0 26.1	+0.8630	.6055	.1381	+90	+20
ω¹ Cancri	6	2.32	2.2	25 43.7	17 35.3	+ 6 12.8	−1.0402	.6020	.1566	−18	−65
ω² Cancri	6½	2.32	2.2	25 25.6	17 53.5	+ 6 30.2	−0.7923	.6018	.1575	0	−65
λ Cancri	6	2.32	+ 0.8	24 24.5	28 0 55.7	−10 45.3	−0.9781	.5968	.1780	−12	−66
γ Cancri	4½	+2.28	− 1.0	+21 54.6	9 38.6	− 2 23.9	−0.1917	.5897	−.2010	+34	−42
80 Cancri	6½	2.21	2.9	18 32.8	20 55.6	+ 8 26.0	+0.6759	.5797	.2267	+90	− 1
83 Cancri	6	2.20	3.4	18 13.5	23 45.2	+11 9.0	+0.3427	.5772	.2323	+65	−19
8 Leonis	6½	2.16	4.7	16 59.4	29 7 6.7	− 5 46.4	−0.2092	.5706	.2456	+33	−48
Uranus				14 30.9	12 27.0	− 0 37.9	+0.8774	.5704	.2549	+90	+ 7
α Leonis	1½	+2.04	− 6.2	+12 33.9	20 19.6	+ 6 57.1	+0.7442	.5593	−.2651	+90	− 2
34 Leonis	6	2.05	6.6	13 57.5	21 41.9	+ 8 16.5	−0.9879	.5582	.2668	− 9	−76
45 Leonis	6	1.96	7.2	10 23.2	30 4 40.8	− 8 59.6	+0.6366	.5526	.2741	+86	− 9
ρ Leonis	4	1.96	7.4	9 56.2	6 57.3	− 6 47.9	+0 4543	.5508	.2761	+71	−19
49 Leon., *mult.*	6	1.93	7.4	9 16.9	7 56.8	− 5 50.5	+0.8255	.5501	.2771	+90	+ 1
c Leonis	5	+1.83	− 8.4	+ 6 45.6	19 29.5	+ 5 18.3	+0.0796	.5421	−.2843	+49	−39
τ Leonis	5	1.71	9.2	3 31.8	31 8 1.4	− 6 34.9	−0.2992	.5349	.2878	+30	−61
89 Leonis	6	+1.69	− 9.6	+ 3 44.4	11 2.5	− 3 39.8	−1.3788	.5334	−.2879	−41	−86

FEBRUARY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
B. A. C. 4200	6	+1.40	− 9.7	− 3 56.2	1 12 30.4	− 3 1.1	−0.9661	.5250	−.2797	− 5	−90
B. A. C. 4225	6½	1.38	9.8	4 22.6	14 19.7	− 1 15.2	−0.9899	.5247	.2779	− 9	−90
f Virginis	6	1.36	9.7	5 9.3	16 48.8	+ 1 9.1	−0.8857	.5243	.2772	− 3	−90
χ Virginis	5	1.33	9.1	7 19.2	17 59.9	+ 2 18.0	+0.9956	.5242	.2764	+83	+ 9
B. A. C. 4259	6	+1.33	− 9.1	− 7 21.5	18 3.7	+ 2 21.6	+1.0165	.5242	−.2763	+83	+10
28 Virginis	6	1.33	9.3	6 49.6	19 18.2	+ 3 33.8	+0.1319	.5241	.2754	+50	−38
ψ Virginis	5	1.26	9.1	8 52.4	2 1 17.3	+ 9 21.5	+0.5939	.5236	.2704	+78	−15
g Virginis	6	1.18	9.1	10 5 1	7 49.8	− 8 18.5	+0.0922	.5234	.2642	+47	−40
50 Virginis	6	1.18	9.4	9 40.6	8 44.1	− 7 25.8	−0.5683	.5234	.2633	+13	−80
58 Virginis	6	+1.14	9.4	9 54.1	12 27.6	− 3 49.4	−1.3110	.5236	−.2594	−38	−90
ι Virginis	5	1.10	9.0	12 4.2	16 55.2	+ 0 29.7	−0.2140	.5239	.2541	+39	−56
B. A. C. 4531	6	1.06	9.0	12 35.2	20 44.8	+ 4 12.0	−0.6451	.5243	.2495	+ 8	−87
83 Virginis	6	1.00	8.3	15 33.8	3 1 25.9	+ 8 44.2	+1.3050	.5250	.2433	+75	+36
85 Virginis	6	0.99	8.4	15 9.2	1 57.7	+ 9 15.0	+0.7494	.5251	.2427	+74	− 5
B. A. C. 4722	6	0.84	8.2	17 37.7	16 9.6	− 1 0.4	+0.0500	.5280	.2215	+39	−42
B. A. C. 4739	6	+0.83	− 8.0	−18 8.8	17 40.7	+ 0 27.8	+0.2631	.5284	−.2190	+50	−30
B. A. C. 4923	6	0.64	7.8	20 51.6	4 11 45.8	− 6 2.7	−0.5349	.5338	.1865	+ 6	−79
B. A. C. 4964	6	0.59	7.1	23 30.9	17 30.8	− 0 29.2	+1.2627	.5356	.1748	+67	+38
B. A. C. 5023	6	0.57	7.7	21 56.7	20 32.6	+ 2 26 6	−0.9397	.5365	.1687	−19	−90
42 Libræ	5½	0 46	7.5	23 25.1	5 7 24.9	−11 3.0	−1.0742	.5400	·1456	−32	−90
B. A. C. 5197	6	+0.43	− 7.4	−24 19.7	9 54.9	− 8 38.1	−0.4499	.5408	−.1401	+ 5	−74

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

FEBRUARY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
b Scorpii	5	+0.41	- 7.0	-25 22.7	5 12 12.6	- 6 25.2	+0.3679	.5415	-.1353	+46	-24
A² Scorp., *mult.*	5	0.40	7.1	24 57.6	13 24.4	- 5 15.8	-0.2437	.5418	.1324	+15	-59
B. A. C. 5253	6	0.40	7.5	24 10.0	13 33.1	- 5 7.4	-1.1210	.5419	.1319	-36	-90
B. A. C. 5255	6	0.40	7.1	25 2.7	13 40.3	- 5 0.4	-0.1867	.5419	.1317	+17	-56
3 Scorpii	6	0.40	7.2	24 52.9	13 52.7	- 4 48.4	-0.3914	.5420	.1312	+ 7	-69
4 Scorpii	6	+0.39	- 6.9	-25 54.3	14 14.2	- 4 27.7	+0.6699	.5421	-.1303	+64	- 6
B. A. C. 5286	6½	0.37	7.6	24 29.1	15 39.1	- 3 5.7	-1.0493	.5425	.1271	-32	-90
π Scorpii	3	0.37	7.1	25 45.6	15 44.6	- 3 0.4	+0.3198	.5426	.1269	+43	-27
B. A. C. 5314	6	0.36	7.2	25 31.4	17 46.2	- 1 2.9	-0.1885	.5431	.1222	+16	-56
B. A. C. 5347	5	0.33	7.0	25 59.9	19 53.4	+ 0 59.9	+0.0720	.5437	.1172	+29	-40
α Scorpii	1½	+0.26	- 7.3	-26 9.6	6 5 22.9	+10 9.6	-0.7580	.5460	-.0943	-16	-90
τ Scorpii	3½	0.22	6.8	27 57.6	8 12.6	-11 6.5	+0.9491	.5466	.0874	+62	+12
B. A. C. 5603	6½	0.19	6.8	28 16.8	12 14.3	- 7 13.3	+0.9683	.5473	.0772	+62	+14
43 Ophiuchi	6	+0.05	7.3	28 1.3	7 5 9.7	+ 9 6.6	-0.2572	.5491	.0341	+ 4	-60
3 Sagittarii	5	-0.02	7.5	27 47.0	15 49.9	- 4 35.7	-0.7384	.5489	-.0065	-23	-90
B. A. C. 6063	6½	-0.05	- 7.5	-28 2.8	19 52.1	- 0 41.8	-0.4535	.5485	+.0039	- 9	-75
B. A. C. 6072	6½	0.06	7.2	28 44.5	20 42.4	+ 0 6.7	+0.3171	.5484	.0059	+32	-27
B. A. C. 6120	6½	0.08	7.5	28 22.3	8 0 19.1	+ 3 35.8	-0.0519	.5480	.0155	+13	-48
B. A. C. 6127	5	0.08	7.3	28 28.2	0 53.5	+ 4 9.0	+0.0663	.5479	.0168	+19	-41
B. A. C. 6190	6½	0.12	7.4	28 41.5	5 1.4	+ 8 8.3	+0.4028	.5472	.0276	+39	-22
B. A. C. 6191	6½	-0.11	- 7.5	-28 19.6	5 1.7	+ 8 8.6	-0.0015	.5472	+.0276	+17	-45
B. A. C. 6220	6½	0.13	7.5	28 29.3	7 5.0	+10 7.6	+0.2401	.5468	.0326	+30	-31
φ Sagittarii	3½	0.18	7.9	27 7.1	17 43.4	- 3 36.0	-0.7899	.5440	.0593	-22	-90
σ Sagittarii	2½	0.20	8.1	26 27.0	22 5.4	+ 0 37.0	-1.2497	.5427	.0698	-56	-90
τ Sagittarii	3½	0.23	7.8	27 51.0	9 3 22.4	+ 5 43.2	+0.7068	.5408	.0825	+63	- 4
B. A. C. 6562	6½	-0.23	- 8.3	-26 6.9	6 17.7	+ 8 32.7	-0.9685	.5397	+.0893	-29	-90
B. A. C. 6666	6	0.26	7.9	27 14.3	13 57.2	- 8 3.2	+1.0320	.5365	.1069	+63	+18
*h*¹ Sagittarii	6	0.29	8.3	24 59.3	16 53.3	- 5 13.0	-1.1455	.5352	.1134	-41	-90
*h*² Sagittarii	4½	0.28	8.3	25 9.3	17 11.8	- 4 55.0	-0.9253	.5351	.1140	-24	-90
B. A. C. 7049	6	0.33	8.4	22 48.0	10 18 35.1	- 4 20.6	+0.0201	.5224	.1651	+32	-43
B. A. C. 8094	6	-0.35	- 4.3	- 4 10.0	14 11 9.2	+ 9 41.1	-0.7594	.4895	+.2614	+ 5	-90
B. A. C. 8134	6½	0.32	4.2	5 20.8	14 23.2	-11 10.2	+1.3839	.4893	.2625	+85	+42
11 Piscium	6½	0.33	3.5	2 28.1	18 55.7	- 6 45.0	-0.5788	.4891	.2638	+15	-60
14 Piscium	6½	0.33	3.2	- 1 55.6	21 33.1	- 4 11.9	-0.4761	.4891	.2645	+20	-73
21 Piscium	6	0.32	2.2	+ 0 23.5	15 6 7.3	+ 4 8.4	-0.7410	.4895	.2657	+ 6	-84
25 Piscium	6½	-0.31	- 2.0	+ 1 24.4	8 8.3	+ 6 6.1	-1.3140	.4897	+.2658	-33	-89
B. A. C. 8311	6½	0.29	- 2.2	- 0 34.6	9 5.0	+ 7 1.2	+1.1023	.4898	.2658	+90	+15
51 Pisc., *mult.*	6½	0.24	+ 0.7	+ 6 16.7	16 5 49.8	+ 3 11.9	-0.8576	.4946	.2630	0	-84
62 Piscium	6	0.18	1.3	6 37.8	14 25.6	+11 33.2	+1.0086	.4977	.2599	+90	+11
δ Piscium	4½	0.19	1.4	6 55.0	14 38.3	+11 44.6	+0.7539	.4978	.2598	+90	-05
101 Piscium	6	-0.05	+ 5.2	+14 2.0	17 15 13.6	+11 38.0	-0.7037	.5111	+.2428	+ 8	-76
104 Piscium	6½	-0.02	5.3	13 39.8	16 59.3	-10 39.5	+0.1191	.5123	.2411	+51	-34
B. A. C. 632	6	+0.06	7.3	17 39.9	18 5 5.7	+ 1 4.6	-1.3038	.5212	.2279	-38	-73
26 Arietis	6½	0.20	8.7	19 18.7	17 55.8	-10 29.9	-0.2290	.5319	.2102	+32	-47
B. A. C. 782	6½	0.23	8.5	18 20.4	19 19.9	- 9 8.6	+1.0904	.5331	.2080	+90	+25
μ Arietis	5½	+0.28	+ 9.1	+19 29.3	23 22.1	- 5 14.5	+0.7024	.5367	+.2016	+90	+ 2
ε Arietis, *mult.*	4½	0.37	9.8	20 51.0	19 6 59.3	+ 2 7.2	+0.7540	.5437	.1882	+90	+ 6
64 Arietis	6	0.53	11.4	24 17.4	17 56.5	-11 18.7	-0.9026	.5541	.1664	- 7	-66
7 Tauri, *mult.*	6	0.59	11.5	24 3.2	22 16.9	- 7 7.6	+0.0466	.5583	.1569	+47	-26
11 Tauri	6	0.63	11.9	24 56.0	20 0 56.3	- 4 34.0	-0.4601	.5609	.1507	+19	-53
g Pleiadum	4½	0.66	11.5	23 54.3	2 39.0	- 2 55.1	+0.8638	.5624	.1467	+90	+18
b Pleiadum	4	+0.66	+11.4	+23 43.7	2 41.0	- 2 53.2	+1.0510	.5624	+.1467	+90	+30
m Pleiadum	7	0.67	11.7	24 27.3	2 47.3	- 2 47.1	+0.3125	.5625	.1465	+63	-12
e Pleiadum	5	0.66	11.6	24 5.0	2 48.9	- 2 45.6	+0.7019	.5626	.1463	+90	+ 8
c Pleiadum	5	0.67	11.5	23 59.1	3 4.5	- 2 30.6	+0.8416	.5628	.1458	+90	+16
d Pleiadum	5	0.68	11.4	23 34.0	3 17.6	- 2 17.9	+1.3080	.5630	.1453	+90	+59
η Tauri	3	+0.68	+11.5	+23 43.6	3 46.4	- 1 50.2	+1.2109	.5634	+.1441	+90	+44

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

FEBRUARY.

Star's— Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	At Conjunction in R. A. Washington Mean Time.	Hour Angle H	Y	x′	y′	Limiting Parallels. N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
h Pleiadum	5½	+0.69	+11.5	+23 45.8	20 4 28.8	− 1 9.4	+1.2741	.5640	+.1425	+90	+53
B. A. C. 1192	6½	0.70	12.0	25 12.5	4 55.3	− 0 43.9	−0.1638	.5645	.1412	+35	−36
p Tauri	6	0.86	12.4	26 9.8	13 18.5	+ 7 20.2	−0.0540	.5720	.1201	+42	−28
φ Tauri, *mult.*	5½	0.93	12.8	27 3.6	17 6.8	+10 59.7	−0.5411	.5754	.1096	+14	−54
B. A. C. 1444	6	1.08	13.0	28 22.7	21 1 21.9	− 5 4.7	−1.0837	.5822	.0863	−23	−62
B. A. C. 1648	6½	+1.38	+11.9	+27 50.0	16 35.7	+ 9 32.0	+0.4390	.5926	+.0395	+74	+ 4
B. A. C. 1649	6½	1.40	12.5	29 26.7	16 38.4	+ 9 34.6	−1.1976	.5927	.0392	−38	−61
β Tauri	2	1.43	12.1	28 30.3	18 34.6	+11 26.0	−0.1716	.5936	.0331	+35	−26
B. A. C. 1709	6½	1.45	12.2	29 5.4	19 50.0	−11 21.7	−0.7264	.5943	.0289	+ 2	−61
B. A. C. 1746	6½	1.47	11.5	27 35.0	22 12.8	− 9 4.9	+0.8612	.5955	.0210	+90	+30
B. A. C. 1772	6	+1.52	+11.9	+29 8.7	23 26.4	− 7 54.4	−0.6985	.5960	+.0170	+ 4	−59
136 Tauri	5	1.60	11.0	27 35.0	22 4 41.8	− 2 52.2	+0.9253	.5981	+.0003	+90	+35
B. A. C. 1882	6½	1.64	11.4	28 55.4	5 51.9	− 1 45.1	−0.4312	.5985	−.0043	+20	−39
κ Aurigæ	4½	1.79	10.6	29 32.6	12 48.8	+ 4 54.2	−1.1655	.6003	.0278	−33	−61
B. A. C. 2097	6½	1.87	9.5	28 17.4	18 21.7	+10 13.0	−0.1126	.6010	.0469	+38	−24
49 Aurigæ	5½	+1.90	+ 9.3	+28 7.1	20 8.8	+11 55.4	−0.0270	.6011	−.0530	+43	−20
53 Aurigæ	6	1.94	9.3	29 5.4	21 17.8	−10 58.5	−1.0627	.6011	.0567	−22	−61
54 Aurigæ	6	1.93	9.2	28 22.3	21 44.6	−10 32.8	−0.3697	.6011	.0584	+24	−39
28 Geminor.	6	1.98	9.1	29 5.7	23 38.7	− 8 43.6	−1.2109	.6011	.0647	−38	−61
39 Geminor.	6½	2.00	7.5	26 14.6	23 4 53.5	− 3 42.2	+1.2581	.6006	.0820	+90	+57
47 Geminor.	6	+2.09	+ 6.9	+27 3.5	9 31.5	+ 0 44.0	+0.0257	.5998	−.0975	+46	−21
53 Geminor.	6	2.14	7.0	28 6.7	11 11.8	+ 2 20.1	−1.1893	.5993	.1026	−34	−62
59 Geminor.	6½	2.18	6.3	27 52.5	14 23.9	+ 5 24.1	−1.2972	.5985	.1130	−60	−62
υ Geminorum	4½	2.22	5.4	27 10.1	18 39.7	+ 9 29.1	−1.1064	.5970	.1267	−24	−63
c Geminorum	6	2.24	4.7	26 4.6	21 45.5	−11 32.8	−0.4281	.5957	.1363	+21	−49
κ Gem., *mult.*	3½	+2.21	+ 4.3	+24 41.5	21 54.6	−11 24.1	+0.9241	.5957	−.1367	+90	+23
ω¹ Cancri	6	2.30	3.5	25 43.8	24 4 7.4	− 5 26.7	−1.0104	.5926	.1555	−15	−65
ω² Cancri	6½	2.30	3.2	25 25.6	4 26.1	− 5 8.8	−0.7591	.5925	.1563	+ 2	−65
λ Cancri	6	2.35	+ 1.7	24 24.5	11 39.6	+ 1 47.0	−0.9524	.5884	.1764	+ 1	−66
γ Cancri	4½	2.38	− 0.5	21 54.6	20 34.8	+10 20.7	−0.1650	.5828	.1995	+36	−41
80 Cancri	6½	+2.37	− 2.9	+18 32.8	25 8 4.8	− 2 36.3	+0.6979	.5749	−.2225	+90	0
83 Cancri	6	2.37	3.5	18 13.5	10 56.6	+ 0 8.8	+0.3607	.5728	.2315	+66	−18
8 Leonis	6½	2.38	4.9	16 59.4	18 23.7	+ 7 19.1	−0.2018	.5675	.2452	+34	−48
URANUS				14 54.2	21 50.5	+10 38.1	+0.9927	.5695	.2518	+90	+15
α Leonis	1½	2.33	7.5	12 33.9	26 7 42.3	− 3 51.8	+0.7423	.5584	.2655	+90	− 2
34 Leonis	6	+2.36	− 7.6	+13 57.5	9 4.8	− 3 32.3	−0.9945	.5574	−.2673	− 9	−76
45 Leonis	6	2.31	8.9	10 23.1	16 4.3	+ 4 12.3	+0.6256	.5529	.2752	+85	−10
ρ Leonis	4	2.30	9.1	9 56.2	18 20.6	+ 6 23.8	+0.4413	.5516	.2774	+70	−20
49 Leonis, *mult.*	6	2.28	9.4	9 16.9	19 20.0	+ 7 21.2	+0.8113	.5510	.2783	+90	0
c Leonis	5	2.24	10.8	6 45.5	27 6 48.9	− 5 33.8	+0.0555	.5448	.2865	+47	−40
τ Leonis	5	+2.18	−12.1	+ 3 31.8	19 12.4	+ 6 24.5	−0.3300	.5394	−.2909	+28	−63
89 Leonis	6	2.17	12.5	+ 3 44.4	22 10.7	+ 9 16.7	−1.4044	.5383	.2913	−45	−86
B. A. C. 4200	6	+2.01	−13.9	− 3 56.3	28 23 7.4	+ 9 24.1	−0.9640	.5378	.2842	−16	−90

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
B. A. C. 4225	6½	+2.00	−13.9	− 4 22.6	1 0 53.9	+11 7.2	−1.0259	.5374	−.2833	−11	−90
f Virginis	6	1.98	14.0	5 9.6	3 19.1	−10 32.4	−0.9241	.5324	.2817	− 5	−90
χ Virginis	5	1.97	13.6	7 19.3	4 28.3	− 9 25.4	+0.9326	.5322	.2808	+83	+ 5
B. A. C. 4259	6	1.97	13.6	7 21.6	4 32.1	− 9 21.8	+0.9528	.5322	.2807	+83	+ 6
28 Virginis	6	1.97	13.8	6 49.6	5 44.7	− 8 11.5	+0.0769	.5322	.2798	+47	−41
ψ Virginis	5	+1.90	−13.8	− 8 52.3	11 33.8	− 2 33.9	+0.5325	.5320	−.2751	+74	−17
g Virginis	6	1.87	13.8	10 5.2	17 55.0	+ 3 34.9	+0.0348	.5322	.2689	+44	−43
59 Virginis	6	1.87	14.0	9 40.6	18 47.7	+ 4 25.8	−0.6176	.5323	.2681	+11	−84
58 Virginis	6	1.86	14.1	9 54.2	22 24.6	+ 7 55.7	−1.3515	.5325	.2641	−43	−90
ι Virginis	5	1.82	13.8	12 4.2	2 2 44.0	−11 53.5	−0.2691	.5330	.2589	+27	−59
B. A. C. 4331	6	+1.86	−13.9	−12 35.2	6 26.6	− 8 18.2	−0.6926	.5335	−.2540	+ 5	−90

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MARCH.

Star's—						At Conjunction in R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0.		Apparent Declination.		Washington Mean Time.			Hour Angle *H*		*Y*	*x'*	*y'*	N'n.	S'n.
		Δα	Δδ												
		s	"	°	'	d	h	m	h	m				°	°
83 Virginis	6	+1.76	-13.2	-15	33.7	**2**	10	58.9	- 3	54.9	+1.2277	.5343	-.2479	+75	+28
85 Virginis	6	1.76	13.3	15	9.3		11	29.7	- 3	25.1	+0.6790	.5343	.2472	+75	- 9
B. A. C. 4722	6	1.67	12.9	17	37.7	**3**	1	14.8	+ 9	52.6	-0.0121	.5373	.2267	+36	-45
B. A. C. 4739	6	1.65	12.8	18	8.9		2	43.1	+11	18.0	+0.1982	.5377	.2227	+47	-34
B. A. C. 4923	6	1.53	12.1	20	51.7		20	14.7	+ 4	14.0	-0.5875	.5423	.1895	+ 3	-84
B. A. C. 4984	6	+1.50	-11.3	-23	31.0	**4**	1	50.0	+ 9	37.8	+1.1863	.5438	-.1777	+67	+29
B. A. C. 5023	6	1.47	11.7	21	56.8		4	46.5	-11	31.8	-0.9863	.5446	.1714	-22	-90
42 Libræ	5½	1.39	11.2	23	25.2		15	21.2	- 1	19.0	-1.1181	.5472	.1475	-35	-90
B. A. C. 5197	6	1.38	10.8	24	19.8		17	47.3	+ 1	2.0	-0.5014	.5478	.1419	+ 2	-78
b Scorpii	5	1.36	10.3	25	22.7		20	1.6	+ 3	11.5	+0.3068	.5483	.1365	+43	-28
A^2 Scor., *mult.*	5	+1.34	-10.5	-24	57.7		21	11.6	+ 4	19.0	-2.2973	.5485	-.1339	+12	-63
B. A. C. 5253	6	1.34	10.7	24	10.1		21	20.1	+ 4	27.2	-1.1641	.5485	.1334	-40	-90
B. A. C. 5255	6	1.34	10.5	25	2.8		21	27.1	+ 4	34.0	-0.2406	.5486	.1331	+14	-59
3 Scorpii	6	1.34	10.5	24	52.9		21	39.2	+ 4	45.7	-0.4429	.5486	.1326	+ 4	-73
4 Scorpii	6	1.34	10.1	25	54.4		22	0.2	+ 5	5.9	+0.6058	.5487	.1318	+60	-11
B. A. C. 5286	6½	+1.33	-10.6	-24	29.2		23	23.0	+ 6	25.8	-1.0929	.5490	-.1284	-35	-90
π Scorpii	3	1.34	10.1	25	45.7		23	28.5	+ 6	31.2	+0.2602	.5490	.1282	+40	-30
B. A. C. 5314	6	1.31	10.2	25	31.5	**5**	1	27.1	+ 8	25.6	-0.2420	.5494	.1233	+14	-59
B. A. C. 5347	5	1.30	10.0	25	59.9		3	31.4	+10	25.4	+0.0161	.5498	.1221	+26	-44
α Scorpii	1½	1.22	9.7	26	9.6		12	48.6	- 4	37.1	-0.8032	.5512	.0951	-19	-90
τ Scorpii	3½	+1.20	- 9.0	-27	57.7		15	35.0	- 1	56.5	+0.8843	.5515	-.0897	+62	+ 7
B. A. C. 5603	6½	1.17	8.8	28	16.8		19	32.1	+ 1	52.2	+0.9074	.5519	.0776	+62	+ 9
43 Ophiuchi	6	1.01	8.3	28	1.3	**6**	12	11.2	- 6	4.3	-0.3021	.5518	.0340	+ 2	-63
3 Sagittarii	5	0.92	7.9	27	47.0		22	43.8	+ 4	5.8	-0.7771	.5508	-.0062	-26	-90
B. A. C. 6063	6½	0.88	7.7	28	2.8	**7**	2	43.5	+ 7	57.0	-0.4936	.5501	+.0043	-11	-78
B. A. C. 6072	6½	+0.88	- 7.4	-28	44.5		3	33.3	+ 8	45.0	+0.2725	.5499	+.0063	+29	-29
γ^1 Sagittarii	4	0.87	7.0	29	35.2		6	19.9	+11	25.8	+1.2286	.5493	.0137	+61	+43
B. A. C. 6120	6½	0.84	7.2	28	22.3		7	8.2	-11	46.7	-0.0934	.5490	.0158	+11	-50
B. A. C. 6127	5	0.84	7.3	28	28.2		7	42.2	-11	14.8	+0.0244	.5491	.0171	+17	-43
B. A. C. 6190	6½	0.81	7.1	28	41.5		11	48.2	- 7	17.4	+0.3603	.5479	.0277	+36	-24
B. A. C. 6191	6½	+0.79	- 7.3	-28	19.6		11	48.7	- 7	16.9	-0.0419	.5479	+.0277	+15	-47
B. A. C. 6220	6½	0.78	7.1	28	29.3		13	51.0	- 5	18.9	+0.1992	.5473	.0331	+28	-33
φ Sagittarii	3½	0.68	7.1	27	7.1	**8**	0	25.8	+ 4	53.9	-0.8234	.5438	.0596	-23	-90
σ Sagittarii	2½	0.64	7.2	26	27.0		4	46.8	+ 9	5.9	-1.2797	.5423	.0702	-62	-90
τ Sagittarii	3½	0.60	6.5	27	51.0		10	2.9	- 9	48.7	+0.6705	.5400	.0828	+60	- 6
B. A. C. 6562	6½	+0.56	- 6.9	-26	6.9		12	57.7	- 6	59.8	-0.9977	.5388	+.0896	-31	-90
B. A. C. 6666	6	0.52	6.2	27	14.3		20	36.6	+ 0	23.7	+0.9979	.5353	.1069	+63	+15
h^1 Sagittarii	6	0.47	6.7	24	59.3		23	32.5	+ 3	13.8	-1.1722	.5338	.1135	-43	-90
h^2 Sagittarii	4½	0.47	6.7	25	9.3		23	51.1	+ 3	31.8	-0.9526	.5337	.1141	-26	-90
B. A. C. 7049	6	0.28	6.2	22	48.0	**10**	1	15.1	+ 4	6.9	-0.0031	.5207	.1649	+31	-45
17 Capricorni	6	+0.22	- 5.9	-21	57.7		9	32.6	-11	50.9	+0.4951	.5164	+.1794	+59	-17
20 Capricorni	6	0.16	6.0	19	30.8		16	22.6	- 5	13.4	-0.9581	.5130	.1905	-17	-90
η Capricorni	5½	0.16	5.8	20	20.5		18	48.5	- 2	51.9	+0.4288	.5118	.1941	+57	-22
30 Capricorni	6	0.11	5.8	18	29.9	**11**	1	48.5	+ 3	55.5	-0.2186	.5086	.2044	+25	-57
31 Capricorni	6½	0.10	5.9	18	58.6		1	58.5	+ 4	5.3	-0.7626	.5085	.2047	+ 4	-90
ι Capricorni	4½	+0.08	- 5.8	-17	21.5		4	3.4	+ 6	6.5	-1.0202	.5075	+.2076	-19	-90
γ Capricorni	3½	0.04	5.4	17	13.1		13	23.9	- 8	49.4	+0.8230	.5036	.2197	+73	0
44 Capricorni	6	0.02	5.7	14	57.8		15	1.7	- 7	14.4	-1.3128	.5029	.2218	-42	-90
45 Capricorni	6	0.01	5.7	15	19.0		15	31.4	- 6	45.5	-0.8113	.5027	.2224	- 4	-90
δ Capricorni	3	+0.03	5.4	16	41.1		17	5.1	- 5	14.6	+1.0517	.5021	.2242	+74	+14
μ Capricorni	5	-0.01	5.6	14	7.9		20	27.3	- 1	58.1	-1.0111	.5008	.2282	-15	-90
ι Aquarii	4	-0.03	- 5.1	-14	28.0	**12**	3	31.6	+ 4	54.1	+1.0005	.4984	+.2294	+76	+11
e^2 Aquarii	6	0.06	5.3	12	10.2		5	49.4	+ 7	8.0	-0.9922	.4979	.2380	-12	-90
42 Aquarii	6	0.05	5.0	13	26.7		9	9.4	+10	22.4	+1.2126	.4966	.2410	+77	+26
σ Aquarii	4½	0.10	- 4.8	-11	18.4		16	44.4	- 6	15.2	+0.7083	.4948	.2475	+79	- 8
δ Piscium	4½	0.27	+ 0.7	+ 6	59.9	**15**	20	33.4	- 4	31.9	+0.7354	.5019	.2616	+90	- 5
101 Piscium	6	-0.25	+ 3.7	+14	2.0	**16**	20	52.8	- 4	55.4	-0.7231	.5149	+.2444	+ 7	-76

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MARCH.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
104 Piscium	6½	−0.24	+ 3.8	+13 39.8	16 22 37.5	− 3 13.9	+0.0972	.5161	+.2426	+50	−35
B. A. C. 632	6	0.20	5.6	17 39.9	17 10 38.0	+ 8 24.3	−1.3262	.5244	.2290	−41	−73
26 Arietis	6	0.11	6.9	19 18.6	23 23.9	− 3 14.5	−0.2558	.5343	.2110	+31	−49
B. A. C. 782	6½	0.08	6.8	18 20.3	18 0 47.7	− 1 53.4	+1.0641	.5354	.2088	+90	+23
μ Arietis	5½	−0.06	7.3	19 29.3	4 49.1	+ 1 59.9	+0.6753	.5387	.2020	+90	+ 1
47 Arietis	6	+0.01	+ 8.0	+20 10.6	11 55.3	+ 8 51.6	+1.3384	.5445	+.1892	+90	+58
ε Arietis, *mult.*	4½	0.01	8.2	20 51.0	12 25.8	+ 9 21.1	+0.7259	.5450	.1883	+90	+ 5
64 Arietis	6	0.12	9.7	24 17.4	23 24.2	− 4 3.6	−0.9373	.5542	.1663	− 9	−66
7 Tauri, *mult.*	6	0.18	9.8	24 3.2	19 3 45.7	+ 0 8.5	+0.0142	.5578	.1565	+45	−28
11 Tauri	6	0.22	10.4	24 56.0	6 26.0	+ 2 43.0	−0.4954	.5601	.1502	+17	−55
g Pleiadum	5½	+0.25	+10.2	+23 54.2	8 9.5	+ 4 22.7	+0.8348	.5615	+.1462	+90	+16
b Pleiadum	4	0.25	10.2	23 43.7	8 11.5	+ 4 24.6	+1.0233	.5615	.1461	+90	+28
m Pleiadum	7	0.24	10.4	24 27.2	8 17.7	+ 4 30.6	+0.2634	.5615	.1460	+60	−14
e Pleiadum	5	0.26	10.3	24 5.0	8 19.4	+ 4 32.2	+0.6722	.5616	.1457	+90	+ 7
c Pleiadum	5	0.26	10.3	23 59.1	8 35.1	+ 4 47.4	+0.8126	.5618	.1453	+90	+15
d Pleiadum	5	+0.26	+10.1	23 34.0	8 48.3	+ 5 0.1	+1.2809	.5620	+.1448	+90	+53
η Tauri	3	0.27	10.1	23 43.6	9 17.3	+ 5 28.0	+1.1833	.5624	.1436	+90	+41
h Pleiadum	5½	0.28	10.3	23 45.7	10 0.0	+ 6 9.1	+1.2474	.5629	.1420	+90	+49
B. A. C. 1192	6	0.27	10.7	25 12.5	10 26.7	+ 6 34.9	−0.1985	.5632	.1407	+33	−37
p Tauri	6	0.40	11.2	26 9.7	18 54.7	− 9 16.2	−0.0896	.5698	.1195	+39	−30
φ Tauri, *mult.*	5½	+0.46	+11.6	+27 3.5	28 45.7	− 5 34.0	−0.5809	.5727	+.1091	+12	−56
B. A. C. 1444	6	0.61	12.2	28 22.7	20 7 7.8	+ 2 28.7	−1.1298	.5784	.0856	−28	−62
B. A. C. 1648	6½	0.89	11.6	27 50.0	22 38.9	− 6 37.4	−0.4055	.5866	.0389	+71	+ 3
B. A. C. 1649	6½	0.90	12.2	29 26.7	22 41.7	− 6 34.7	−1.2500	.5866	.0389	−48	−61
β Tauri	2	0.94	11.9	28 30.3	21 0 40.5	− 4 40.6	−0.2124	.5873	.0326	+32	−28
B. A. C. 1709	6½	+0.96	+11.9	+29 5.4	1 57.7	− 3 26.6	−0.7737	.5878	+.0285	− 1	−61
B. A. C. 1746	6½	1.00	11.3	27 35.0	4 23.8	− 1 6.4	+0.8323	.5887	.0209	+90	+28
B. A. C. 1772	6	1.03	11.8	29 8.8	5 39.2	+ 0 5.9	−0.7469	.5891	+.0167	+ 1	−61
136 Tauri	5	1.11	11.0	27 35.0	11 2.6	+ 5 16.1	+0.8978	.5905	−.0006	+90	+34
B. A. C. 1882	6½	1.15	11.4	28 55.4	12 14.6	+ 6 25.1	−0.4749	.5907	.0045	+18	−42
κ Aurigæ	4½	+1.30	+11.2	+29 32.6	19 23.3	−10 43.7	−1.2215	.5916	−.0274	−42	−61
B. A. C. 2097	6½	1.39	10.2	28 17.6	22 1 5.9	− 5 15.3	−0.1550	.5918	.0458	+36	−26
49 Aurigæ	5½	1.43	9.9	28 7.1	2 56.3	− 3 29.5	−0.0675	.5917	.0520	+41	−22
53 Aurigæ	6	1.46	10.1	29 5.4	4 7.4	− 2 21.3	−1.1187	.5916	.0559	−27	−61
54 Aurigæ	6	1.46	9.9	28 22.3	4 35.1	− 1 54.7	−0.4151	.5916	.0572	+21	−42
28 Geminor.	6	+1.48	+10.0	+29 5.8	6 32.8	− 0 1.9	−1.2682	.5914	−.0636	−52	−61
39 Geminor.	6½	1.58	8.3	26 14.6	11 57.9	+ 5 9.7	+1.2368	.5906	.0807	+90	+54
47 Geminor.	6	1.68	8.0	27 3.6	16 45.3	+ 9 45.5	−0.0135	.5894	.0957	+44	−23
53 Geminor.	6	1.73	8.2	28 6.7	18 29.0	+11 25.0	−1.2488	.5889	.1009	−44	−62
υ Geminorum	4½	1.84	6.8	27 10.2	23 2 12.7	− 5 10.2	−1.1633	.5862	.1241	−30	−63
e Geminorum	6	+1.86	+ 6.0	+26 4.6	5 24.9	− 2 5.7	−0.4736	.5847	−.1337	+18	−52
κ Gemi., *mult.*	3½	1.84	5.5	24 41.6	5 34.4	− 1 56.6	+0.9007	.5847	.1340	+90	+22
ω¹ Cancri	6	1.95	4.8	25 43.8	12 0.8	+ 4 14.4	−1.0651	.5817	.1520	−20	−65
ω² Cancri	6½	1.96	4.8	25 25.6	12 20.2	+ 4 31.5	−0.8100	.5814	.1531	− 1	−65
λ Cancri	6	2.05	3.2	24 24.5	19 49.5	+11 45.8	−1.0058	.5774	.1730	−14	−66
ζ Cancri	4½	+2.11	+ 1.0	+21 54.6	24 5 4.1	− 3 22.4	−0.2031	.5720	−.1954	+33	−43
80 Cancri	6½	2.18	− 1.9	18 32.8	16 58.1	+ 8 2.8	+0.6781	.5647	.2212	+90	0
83 Cancri	6	2.20	2.3	18 13.5	19 56.2	+10 57.7	+0.3349	.5629	.2270	+64	−19
8 Leonis	6½	2.24	3.8	16 59.4	25 3 38.0	− 5 38.5	−0.2336	.5581	.2408	+32	−50
Uranus				15 12.5	5 33.0	− 3 47.8	+1.0780	.5616	.2441	+90	+21
α Leonis	1½	2.28	7.0	12 33.9	17 20.8	+ 7 32.7	+0.7301	.5503	.2612	+90	− 3
34 Leonis	6	+2.32	− 7.0	+13 57.5	18 45.6	+ 8 54.4	−1.0294	.5496	−.2630	−12	−76
45 Leonis	6	2.30	8.7	10 23.2	26 1 56.2	− 8 7.2	+0.6146	.5460	.2711	+84	−10
ρ Leonis	4	2.31	9.1	9 56.2	4 15.8	− 5 52.8	+0.4299	.5448	.2733	+70	−20
49 Leon., *mult.*	6	2.31	9.3	9 16.9	5 16.7	− 4 54.1	+0.8043	.5444	.2743	+90	− 1
c Leonis	5	2.32	11.3	6 45.5	17 0.4	+ 6 23.9	+0.0471	.5398	.2832	+47	−41
τ Leonis	5	+2.32	−13.2	+ 3 31.8	27 5 36.0	− 5 23.8	−0.3334	.5361	−.2885	+27	−63

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MARCH.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
89 Leonis	6	+2.33	-13.6	+ 3 44.4	27 8 36.7	- 2 29.0	-1.4129	.5354	-.2890	-48	-86
B. A. C. 4200	6	2.30	16.1	- 3 56.3	28 9 42.6	- 2 12.6	-0.9442	.5333	.2839	- 6	-90
B. A. C. 4225	6½	2.30	16.2	4 22.7	11 29.1	- 0 29.6	-1.0051	.5334	.2832	-10	-90
f Virginis	6	2.30	16.3	5 9.6	13 54.2	+ 1 50.8	-0.9003	.5336	.2817	- 4	-90
χ Virginis	5	2.29	16.3	7 19.3	15 3.3	+ 2 57.7	+0.9570	.5336	.2809	+83	+ 6
B. A. C. 4259	6	+2.29	-16.3	- 7 21.6	15 7.1	+ 3 1.3	+0.9786	.5336	-.2808	+83	+ 7
28 Virginis	6	2.30	16.3	6 49.7	16 19.5	+ 4 11.4	+0.1021	.5338	.2801	+39	-49
ψ Virginis	5	2.29	16.6	8 52.5	22 7.3	+ 9 47.8	+0.5619	.5344	.2756	+75	-16
g Virginis	6	2.28	16.8	10 5.2	29 4 26.2	- 8 5.7	+0.0708	.5353	.2696	+46	-41
50 Virginis	6	2.29	16.9	9 40.7	5 18.4	- 7 15.3	-0.5794	.5355	.2688	+13	-81
58 Virginis	6	+2.28	17.2	- 9 54.2	8 53.5	- 3 47.2	-1.3086	.5362	-.2650	-37	-90
i Virginis	6	2.27	17.1	12 4.3	13 10.3	+ 0 21.0	-0.2255	.5372	.2600	+29	-57
B. A. C. 4531	6	2.27	17.1	12 35.3	16 50.3	+ 3 53.7	-0.6439	.5381	.2554	+ 8	-87
83 Virginis	6	2.27	16.8	15 33.9	21 19.1	+ 8 13.5	+1.2717	.5392	.2494	+75	+33
85 Virginis	6	2.27	16.8	15 9.3	21 49.5	+ 8 42.9	+0.7259	.5394	.2487	+75	- 7
B. A. C. 4722	6	+2.25	-16.5	-17 37.8	30 11 21.6	- 2 12.5	+0.0482	.5435	-.2271	+39	-42
B. A. C. 4739	6½	2.26	16.5	18 9.0	12 48.3	- 0 48.8	+0.2576	.5440	.2248	+50	-31
B. A. C. 4923	6	2.22	15.6	20 51.7	31 5 59.3	- 8 13.3	-0.5107	.5495	.1914	+ 7	-78
B. A. C. 4964	6	2.21	14.7	23 31.0	11 27.4	- 2 56.7	+1.2511	.5513	.1796	+67	+37
B. A. C. 5023	6	+2.20	-15.0	-21 56.9	14 20.0	- 0 10.2	-0.9009	.5521	-.1732	-17	-90

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
42 Libræ	5½	+2.17	-14.1	-23 25.2	1 0 40.5	+ 9 48.3	-1.0252	.5549	-.1491	-27	-90
B. A. C. 5197	6	2.17	13.8	24 19.8	3 3.3	-11 54.2	-0.4121	.5556	.1433	+ 6	-70
b Scorpii	5	+2.17	-13.3	-25 22.8	5 14.5	- 9 47.6	+0.3885	.5561	-.1378	+48	-23
A² Scorp., *mult.*	5	2.16	13.3	24 57.7	6 22.9	- 8 41.7	-0.2089	.5563	.1350	+16	-57
B. A. C. 5253	6	2.15	13.4	24 10.1	6 31.2	- 8 30.7	-1.0681	.5563	.1345	-32	-90
B. A. C. 5255	6	2.16	13.2	25 2.8	6 38.1	- 8 27.1	-0.1527	.5564	.1343	+19	-53
3 Scorpii	6	2.15	13.3	24 53.0	6 50.0	- 6 7.2	-0.3589	.5564	.1338	+ 8	-67
4 Scorpii	6	+2.17	-12.9	-25 54.4	7 10.4	- 7 55.9	+0.6858	.5565	-.1330	+64	- 6
B. A. C. 5286	6½	2.13	13.3	24 29.2	8 31.5	- 6 37.7	-0.9954	.5568	.1295	-28	-90
π Scorpii	3	2.15	12.9	25 45.7	8 36.7	- 6 32.6	+0.3439	.5568	.1293	+44	-25
B. A. C. 5314	6	2.14	12.8	25 31.5	10 32.7	- 4 41.0	-0.1530	.5572	.1245	+18	-54
B. A. C. 5347	5	2.14	12.5	26 0.0	12 34.2	- 2 44.1	+0.1042	.5575	.1194	+31	-39
σ Scorpii	3½	+2.10	-12.3	-25 18.0	18 10.0	+ 2 39.9	-1.2706	.5582	.1050	-56	-90
α Scorpii	1½	2.09	11.8	26 9.6	21 38.9	+ 6 1.2	-0.7034	.5586	.0958	-13	-90
τ Scorpii	3½	2.09	11.1	27 57.7	2 0 21.6	+ 8 37.9	+0.9725	.5588	.0886	+62	+14
B. A. C. 5603	6½	2.08	10.7	28 16.9	4 13.7	-11 38.4	+0.9943	.5590	.0782	+62	+16
43 Ophiuchi	6	1.95	9.4	28 1.4	20 32.7	+ 4 5.0	-0.1973	.5581	.0340	+ 8	-56
3 Sagittarii	5	+1.87	- 8.5	-27 47.1	3 6 54.0	- 9 56.1	-0.6665	.5561	-.0061	-20	-40
B. A. C. 6063	6½	1.83	7.9	28 2.8	10 49.7	- 6 9.0	-0.3848	.5551	+.0047	- 5	-60
B. A. C. 6072	6½	1.83	7.6	28 44.5	11 38.7	- 5 21.7	+0.3755	.5549	.0068	+35	-23
B. A. C. 6120	6½	1.80	7.5	28 22.3	15 10.3	- 1 57.7	+0.0130	.5538	.0161	+16	-44
B. A. C. 6127	5	1.78	7.2	28 28.3	15 43.8	- 1 25.4	+0.1305	.5536	.0177	+23	-37
B. A. C. 6190	6½	+1.75	- 6.8	-28 41.5	19 46.2	+ 2 28.3	+0.4640	.5522	+.0282	+43	-18
B. A. C. 6191	6½	1.75	7.0	28 19.6	19 46.6	+ 2 28.7	+0.0655	.5522	.0282	+20	-41
B A. C. 6220	6½	1.73	6.7	28 29.3	21 47.2	+ 4 25.1	+0.3044	.5515	.0334	+34	-27
φ Sagittarii	3½	1.61	6.1	27 7.0	4 8 14.1	- 9 30.1	-0.7101	.5470	.0600	-17	-90
σ Sagittarii	2½	1.56	5.9	26 26.9	12 32.3	- 5 20.9	-1.1639	.5449	.0706	-47	-90
τ Sagittarii	3½	1.53	4.9	27 51.0	17 45.4	- 0 18.5	+0.7764	.5423	.0831	+63	0
B. A. C. 6562	6½	+1.49	- 5.2	-26 6.8	20 38.8	+ 2 29.0	-0.8833	.5408	+.0900	-24	-90
B. A. C. 6666	6	1.41	4.1	27 14.2	5 4 14.7	+ 9 49.5	+1.1028	.5367	.1073	+63	+24
*h*¹ Sagittarii	6	1.37	4.7	24 59.3	7 9.0	-11 22.0	-1.0568	.5349	.1137	-33	-90
*h*² Sagittarii	4½	1.36	4.6	25 9.3	7 27.5	-11 4.0	-0.8383	.5349	.1143	-18	-90
B. A. C. 7049	6	1.09	2.9	22 47.9	6 8 46.5	-10 34.0	+0.1049	.5202	.1645	+36	-39
17 Capricorni	6	+0.98	- 2.7	-21 57.6	17 3.7	- 2 32.2	+0.5988	.5155	+.1787	+65	-12

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

APRIL.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
20 Capricorni	6	+0.89	− 2.9	−19 30.7	6 23 53.9	+ 4 5.5	−0.8535	.5118	+.1895	−11	−90
η Capricorni	5½	0.88	2.4	20 20.4	7 2 20.0	+ 6 27.2	+0.5306	.5105	.1923	+63	−16
30 Capricorni	6	0.80	2.5	18 29.9	9 20.6	−10 44.7	−0.1177	.5100	.2035	+30	−51
31 Capricorni	6½	0.79	2.6	17 58 6	9 30.6	−10 35.0	−0.6614	.5099	.2036	+ 2	−90
ι Capricorni	4½	0.77	2.6	17 21.5	11 35.5	− 8 33.8	−0.9093	.5061	.2065	−12	−90
γ Capricorni	3½	+0.60	− 2.0	−17 30.0	20 57.2	+ 0 31.6	+0.9173	.5020	+.2185	+73	+ 6
44 Capricorni	6	0.65	2.4	14 57.7	22 35.1	+ 2 6.7	−1.2181	.5014	.2204	−32	−90
45 Capricorni	6	0.65	2.3	15 18.9	23 5.0	+ 2 35.8	−0.7186	.5012	.2210	+ 1	−90
δ Capricorni	3	0.65	1.8	16 41.1	8 0 38.8	+ 4 6.9	+1.1429	.5006	.2229	+74	+21
μ Capricorni	5	0.60	2.3	14 7.8	4 1.4	+ 7 23.7	−0.9194	.4993	.2268	−10	−90
ι Aquarii	4	+0.54	− 1.7	−14 28.0	11 6.6	− 9 43.1	+1.0842	.4970	+.2342	+76	+16
e² Aquarii	5½	0.50	2.1	12 10.2	13 24.5	− 7 29.2	−0.9064	.4964	.2364	− 7	−90
42 Aquarii	6	0.49	1.6	13 26.7	16 44.9	− 4 14.3	+1.2927	.4954	.2397	+77	+34
σ Aquarii	4½	0.42	1.4	11 18.4	9 0 20.4	+ 3 8.5	+0.7823	.4937	.2461	+73	− 3
58 Aquarii	6	0.42	1.4	11 32.1	0 54.3	+ 3 41.4	+1.1725	.4936	.2465	+79	+22
64 Aquarii	6½	+0.39	− 1.4	−10 40.0	5 5.4	+ 7 45.6	+1.2557	.4929	+.2497	+80	+29
λ Aquarii	4	0.30	1.3	8 14.0	12 27.9	− 9 4.1	+0.4453	.4919	.2548	+68	−22
78 Aquarii	6	0.29	1.3	7 51.5	13 33.1	− 8 0.7	+0.3095	.4918	.2554	+60	−29
81 Aquarii	6	0.26	1.0	7 43.3	17 19.7	− 4 20.3	+1.1288	.4916	.2576	+83	+18
82 Aquarii	6	0.26	1.1	7 14.1	17 58.0	− 3 43.1	+0.7593	.4916	.2579	+79	− 6
B. A. C. 8094	6	+0.20	− 1.2	− 4 9.8	10 1 11.9	+ 3 19.0	−0.7181	.4916	+.2614	+ 7	−90
B. A. C. 8134	6½	0.19	0.8	5 20.7	4 23.9	+ 6 25.8	+1.4090	.4918	.2628	+85	+47
11 Piscium	6½	0.13	1.0	2 28.1	8 53.0	+10 47.5	−0.5454	.4922	.2643	+17	−78
14 Piscium	6	0.12	0.9	− 1 55.6	11 28.4	−10 41.4	−0.4484	.4924	.2650	+22	−71
21 Piscium	6	0.06	0.6	+ 0 23.6	19 54.9	− 2 28.9	−0.7221	.4934	.2667	+ 7	−87
25 Piscium	6	+0.05	− 0.5	+ 1 24.4	21 54.0	− 0 33.1	−1.2912	.4942	+.2670	−31	−89
B. A. C. 8311	6½	+0.05	− 0.1	− 0 34.5	22 49.8	+ 0 21.1	−1.1051	.4944	.2670	+90	+16
ε Arietis, *mult.*	4½	−0.13	+ 6.8	+20 50.9	14 18 36.7	− 6 40.6	−0.6234	.5512	.1894	+88	− 1
64 Arietis	6	0.07	7.9	24 17.3	15 5 23.8	+ 3 43.4	−1.0397	.5604	.1669	−17	−66
66 Arietis	6½	0.04	7.7	22 22.8	7 11.1	+ 5 26.8	+1.2411	.5618	.1628	+90	+45
7 Tauri, *mult.*	6	−0.04	+ 8.2	+24 3.1	9 41.0	+ 7 51.2	−0.0987	.5639	+.1571	+39	−34
11 Tauri	6	−0.02	8.7	24 55.9	12 18.7	+10 23.2	−0.6079	.5660	.1509	+11	−62
g Pleiadum	5½	0.00	8.5	23 54.2	14 0.5	−11 58.9	+0.7130	.5674	.1469	+90	+ 9
b Pleiadum	4	+0.01	8.5	23 43.6	14 2.5	−11 57.0	+0.9005	.5674	.1466	+90	+20
m Pleiadum	7	0.00	8.7	24 27.2	14 9.0	−11 50.6	+0.1603	.5675	.1464	+54	−20
e Pleiadum	5	0.00	+ 8.4	+24 4.9	14 10.3	−11 49.4	+0.5513	.5675	+.1464	+82	0
c Pleiadum	5	0.00	8.6	23 59.0	14 25.8	−11 34.5	+0.6904	.5678	.1456	+90	+ 8
d Pleiadum	5	+0.02	8.5	23 34.0	14 38.8	−11 22.0	+1.1558	.5679	.1452	+90	+39
η Tauri	3	0.02	8.5	23 43.5	15 7.3	−10 54.6	+1.0585	.5683	.1440	+90	+31
f Pleiadum	4	0.02	8.6	23 40.7	15 48.9	−10 14.6	+1.2070	.5689	.1423	+90	+44
h Pleiadum	5½	+0.02	+ 8.6	+23 45.7	15 49.4	−10 14.1	+1.1218	.5689	+.1423	+90	+36
B. A. C. 1192	6	0.02	8.9	25 12.5	16 15.7	− 9 48.7	−0.3170	.5692	.1413	+27	−44
p Tauri	6	0.09	9.5	26 9.7	16 0 36.3	− 1 47.2	−0.2153	.5753	.1196	+32	−36
φ Tauri, *mult.*	5½	0.14	9.9	27 3.5	4 24.4	+ 1 52.1	−0.7070	.5779	.1093	+ 4	−63
χ¹ Tauri	5½	0.16	9.5	25 20.4	5 19.8	+ 2 45.3	+1.1676	.5786	.1064	+90	+44
χ² Tauri	8½	+0.16	+ 9.5	+25 20.7	5 20.0	+ 2 45.5	+1.1628	.5786	+.1064	+90	+44
B. A. C. 1444	6	0.26	10.4	28 22.7	12 40.7	+ 9 48.9	−1.2612	.5830	.0855	−48	−62
B. A. C. 1648	6½	0.49	10.4	27 50.0	17 4 4.0	+ 0 35.1	+0.2580	.5897	.0385	+60	− 4
β Tauri	2	0.51	10.7	28 30.3	6 4.8	+ 2 31.0	−0.3597	.5902	.0321	+24	−37
B. A. C. 1709	6½	0.56	10.8	29 5.4	7 21.7	+ 3 44.9	−0.9211	.5905	.0280	−11	−61
B. A. C. 1746	6½	0.58	10.5	27 35.0	9 47.1	+ 6 4.3	+0.6814	.5911	.0204	+90	+19
B. A. C. 1772	6	+0.61	+10.9	+29 8.7	11 2.3	+ 7 16.4	−0.8966	.5914	+.0162	− 9	−61
136 Tauri	5	0.68	10.2	27 35.0	16 24.8	−11 34.4	+0.7442	.5922	−.0011	+90	+24
B. A. C. 1882	6½	0.72	10.6	28 55.4	17 36.7	−10 25 5	−0.6307	.5922	.0047	+ 8	−53
B. A. C. 2097	6½	0.94	9.9	28 17.6	18 6 29.0	+ 1 55.1	−0.3151	.5918	.0463	+26	−35
49 Aurigæ	5½	0.97	9.6	28 7.1	8 19.8	+ 3 41.3	−0.2281	.5915	.0524	+31	−31
54 Aurigæ	6	+1.00	+ 9.7	+28 22.3	9 59 2	+ 5 16.7	−0.5772	.5912	−.0575	+12	−52

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

APRIL.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
39 Geminor.	6½	+1.11	+ 8.4	+26 14.6	18 17 24.9	-11 35.8	+1.0784	.5890	-.0808	+90	+39
40 Geminor.	6½	1.11	8.2	26 4.9	17 40.1	-11 21.3	+1.2224	.5889	.0814	+90	+52
47 Geminor.	6	1.19	8.3	27 3.6	22 14.8	- 6 57.6	-0.1780	.5872	.0955	+34	-32
A Geminor.	5½	1.25	7.2	25 17.2	19 2 59.1	- 2 24.8	+1.1379	.5852	.1094	+90	+41
B. A. C. 2514	6½	1.35	6.3	24 30.0	9 9.4	+ 3 30.7	+1.2048	.5831	.1273	+90	+47
c Gem., *mult.*	6	+1.40	+ 6.6	+26 4.6	11 3.9	+ 5 20.8	-0.6440	.5810	-.1326	+ 8	-61
κ Geminor.	3½	1.40	6.1	24 41.6	11 13.6	+ 5 30.1	+0.7396	.5809	.1331	+90	+12
ω^1 Cancri	6	1.51	5.8	25 43.8	17 46.0	+11 47.1	-1.2405	.5771	.1507	-38	-65
ω^2 Cancri	6½	1.52	5.8	25 25.6	18 5.7	-11 54.0	-0.9838	.5769	.1515	-13	-65
μ^1 Cancri	6	1.51	4.8	22 59.2	19 58.8	-10 5.3	+1.2006	.5757	.1565	+90	+42
λ Cancri	6	+1.61	+ 4.4	+24 24.6	20 1 43.4	- 4 34.0	-1.1825	.5720	-.1710	-30	-66
γ Cancri	4½	1.71	+ 2.2	21 54.6	11 9.8	+ 4 31.0	-0.3700	.5657	.1930	+24	-52
80 Cancri	6½	1.81	- 0.3	18 32.8	23 21.1	- 7 44.7	+0.5253	.5573	.2178	+78	- 9
83 Cancri	6	1.85	0.9	18 13.5	21 2 23.8	- 4 48.5	+0.1788	.5553	.2233	+54	-27
8 Leonis	6	1.93	2.6	16 59.3	10 17.9	+ 2 48.7	-0.3906	.5501	.2366	+24	-58
URANUS				+15 20.4	11 28.8	+ 3 57.1	+0.9961	.5501	-.2384	+90	+16
ψ Leonis	6	+1.92	- 3.7	14 34.9	13 17.8	+ 5 42.3	+1.3256	.5483	.2411	+90	+44
ν Leonis	5	1.96	5.1	13 1.8	19 47.9	+11 59.1	+1.2957	.5445	.2503	+90	+39
α Leonis	1½	2.00	5.7	12 34.0	22 0 24.6	- 7 33.8	+0.5951	.5421	.2561	+83	-10
34 Leonis	6	2.06	5.5	13 57.6	1 51.8	- 6 9.6	-1.1858	.5413	.2579	-24	-76
45 Leonis	6	+2.07	- 7.5	+10 23.2	9 15.3	+ 0 59.1	+0.4876	5377	-.2658	+74	-17
ρ Leonis	4	2.08	8.0	9 56.2	11 39.1	+ 3 18.1	+0.3025	.5366	.2680	+61	-26
49 Leonis, *mult.*	6	2.08	8.3	9 17.0	12 41.6	+ 4 18.5	+0.6834	.5362	.2688	+90	- 7
c Leonis	5	2.16	10.5	6 45.5	23 0 46.1	- 8 0.8	-0.0682	.5317	.2775	+41	-47
τ Leonis	5	2.22	12.7	+ 3 31.8	13 43.1	+ 4 31.1	-0.4341	.5288	.2827	+22	-60
B. A. C. 4200	6	+2.36	-16.5	- 3 56.3	24 18 30.7	+ 8 23.5	-1.0000	.5281	-.2795	-10	-90
B. A. C. 4225	6½	2.35	16.7	4 22.7	20 19.4	+10 8.6	-1.0588	.5283	.2786	-14	-90
f Virginis	6	2.37	17.0	5 9.5	22 47.3	-11 28.2	-0.9491	.5286	.2773	- 7	-90
χ Virginis	5	2.36	17.2	7 19.4	23 57.6	-10 20.1	+0.9339	.5290	.2765	+83	+ 5
B. A. C. 4259	6	2.36	17.2	7 21.6	25 0 1.4	-10 16.5	+0.9530	.5290	.2765	+83	+ 6
28 Virginis	6	+2.38	-17.3	- 6 49.7	1 15.2	- 9 5.0	+0.0720	.5291	-.2758	+47	-41
ψ Virginis	5	2.40	17.8	8 52.5	7 9.3	- 3 22.3	+0.5471	.5304	.2716	+74	-16
g Virginis	6	2.43	18.2	10 5.2	13 34.1	+ 2 50.1	+0.0617	.5320	.2661	+45	-41
50 Virginis	6	2.44	18.3	9 40.7	14 27.0	+ 3 41.2	-0.5916	.5322	.2652	+12	-82
58 Virginis	6	2.45	18.4	9 54.2	18 5.0	+ 7 12.1	-1.3195	.5333	.2617	-39	-90
i Virginis	6	+2.47	-18.6	-12 4.3	22 25.0	+11 23.7	-0.2175	.5348	-.2569	+30	-56
B. A. C. 4531	6	2.49	18.5	12 35.3	26 2 7.2	- 9 1.4	-0.6320	.5361	.2524	+ 8	-86
83 Virginis	6	2.52	18.9	15 33.9	6 38.8	- 4 38.8	+1.3023	.5377	.2466	+75	+36
85 Virginis	6	2.53	19.0	15 9.3	7 9.4	- 4 9.1	+0.7537	.5379	.2459	+73	- 4
B. A. C. 4722	6	2.60	18.9	17 37.9	20 46.4	+ 9 0.3	+0.1004	.5435	.2253	+42	-39
B. A. C. 4739	6½	+2.61	-18.8	-18 9.0	22 13.5	+10 24.5	+0.3126	.5441	-.2229	+53	-28
B. A. C. 4923	6	2.68	18.0	20 51.8	27 15 25.2	+ 3 0.6	-0.4256	.5515	.1903	+11	-71
B. A. C. 5023	6	2.72	17.3	21 56.9	23 44.3	+11 2.0	-0.8015	.5549	.1720	-11	-90
42 Libræ	5½	2.76	16.2	23 25.3	28 10 1.2	- 3 3.2	-0.9084	.5585	.1483	-20	-90
B. A. C. 5197	6	2.77	15.9	24 19.9	12 22.9	- 0 46.6	-0.2922	.5592	.1426	+14	-62
b Scorpii	5	+2.79	-15.5	-25 22.8	14 33.2	+ 1 19.0	+0.5101	.5598	-.1372	+55	-16
A^2 Scor., *mult.*	5	2.78	15.5	24 57.7	15 41.1	+ 2 24.4	-0.0842	.5601	.1345	+22	-49
B. A. C. 5253	6	2.77	15.7	24 10.1	15 49.3	+ 2 32.3	-0.9417	.5602	.1340	-24	-90
B. A. C. 5255	6	2.78	15.4	25 2.9	15 56.2	+ 2 39.0	-0.0282	.5602	.1338	+25	-47
3 Scorpii	6	2.78	15.5	24 53.0	16 7.9	+ 2 50.3	-0.2281	.5602	.1333	+15	-58
4 Scorpii	6	2.80	15.3	25 54.5	16 28.2	+ 3 9.8	+0.8095	.5603	.1325	+64	+ 2
B. A. C. 5286	6½	+2.79	-15.3	-24 29.3	17 48.6	+ 4 27.3	-0.8682	.5604	-.1312	-20	-90
π Scorpii	3	2.79	15.2	25 45.7	17 53.8	+ 4 32.3	+0.4701	.5606	.1289	+52	-18
B. A. C. 5314	6	2.79	15.0	25 31.5	19 48.8	+ 6 23.2	-0.0226	.5611	.1241	+24	-46
B. A. C. 5347	5	2.80	14.7	26 0.0	21 49.2	+ 8 19.2	+0.2367	.5615	.1188	+38	-31
σ Scorpii	3½	2.79	14.2	25 18.0	29 3 21.8	-10 20.4	-1.1262	.5628	.1044	-40	-90
α Scorpii	1½	+2.81	-13.4	-26 9.7	6 48.5	- 7 1.2	-0.5550	.5633	-.0953	- 5	-84

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

APRIL.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
τ Scorpii	3½	+2.84	-12.9	-27 57.7	29 9 29.5	- 4 26.2	+1.1184	.5637	-.0879	+62	+27
B. A. C. 5603	6½	2.84	12.4	28 16.9	13 19.0	- 0 45.2	+1.1445	.5639	.0774	+62	+30
B. A. C. 5800	6½	2.77	11.1	26 50.3	30 1 37.8	+11 6.4	-1.1495	.5637	.0437	-48	-90
43 Ophiuchi	6	2.78	10.3	28 1 4	5 26.4	- 9 13.5	-0.0221	.5633	.0332	+16	-46
3 Sagittarii	5	2.72	8.7	27 47.1	15 40.0	+ 0 37.6	-0.4774	.5613	-.0053	-10	-77
B. A. C. 6063	6½	+2.70	- 8.0	-28 2.8	19 32.9	+ 4 22.1	-0.1925	.5601	+.0056	+ 5	-56
B. A. C. 6072	6½	2.72	8.0	28 44.5	20 21.3	+ 5 8.7	+0.5648	.5598	.0078	+48	-12
B. A. C. 6120	6½	+2.69	- 7.3	-28 22.3	23 50.2	+ 8 30.1	+0.2079	.5587	+.0172	+27	-32

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
B. A. C. 6127	5	+2.69	- 7.2	-28 28.3	1 0 23.4	+ 9 2.1	+0.3258	.5585	+.0186	+34	-26
B. A. C. 6190	6½	2.68	6.4	28 41.5	4 22.9	-11 7.0	+0.6616	.5570	.0292	+57	- 6
B. A. C. 6191	6½	2.66	6.6	28 19.6	4 23.2	-11 6.8	+0.2644	.5570	.0292	+31	-29
B. A. C. 6194	6	2.63	6.9	27 5.2	4 42.6	-10 48.1	-1.0723	.5568	.0301	-43	-90
B. A. C. 6220	6½	+2.65	- 6.4	-28 29.3	6 22.4	-11 10.2	+0.5048	.5561	+.0345	+46	-16
φ Sagittarii	3½	2.54	4.9	27 7.0	16 42.4	- 1 12.2	-0.4952	.5513	.0610	- 6	-78
σ Sagittarii	2½	2.49	4.6	26 26.9	20 57.9	+ 2 54.2	-0.9432	.5490	.0717	-30	-90
τ Sagittarii	3½	2.47	3.4	27 50.9	2 2 7.9	+ 7 53.5	+0.9922	.5461	.0843	+62	+16
B. A. C. 6562	6½	2.41	3.6	26 6.8	4 59.7	+10 39.4	-0.6581	.5444	.0910	-11	-90
ψ Sagittarii	6	+2.38	- 3.6	-25 28.0	6 3.2	+11 40.7	-1.2688	.5437	+.0935	-32	-90
h¹ Sagittarii	6	2.29	2.4	24 59.2	15 24.7	- 3 16.8	-0.8236	.5380	.1146	-18	-90
h² Sagittarii	4½	2.29	2.3	25 9.2	15 43.0	- 2 59.2	-0.6058	.5377	.1154	- 6	-89
4 Capricorni	6	2.02	- 0.6	22 11.3	3 11 18.7	- 8 1.7	-1.2198	.5249	.1547	-43	-90
B. A. C. 7049	6	1.98	+ 0.3	22 47.9	16 54 2	- 2 36.8	+0.3467	.5213	.1648	+49	-25
17 Capricorni	6	+1.87	+ 1.1	-21 57.6	4 1 10.4	+ 5 23.9	+0.8420	.5164	+.1787	+68	+ 3
20 Capricorni	6	1.76	1.0	19 30.6	8 0.3	-11 58.5	-0.6074	.5120	.1892	+ 3	-85
Mars				19 5.8	9 49.1	- 8 14.7	-0.7219	.4967	.1856	- 3	-90
η Capricorni	5½	1.75	1.7	20 20.4	10 26.4	- 7 38.5	+0.7748	.5105	.1931	+64	- 2
30 Capricorni	6	1.65	1.7	18 29.9	17 27.4	- 0 50.1	+0.1271	.5066	.2029	+42	-38
31 Capricorni	6½	+1.64	+ 1.6	-17 58.4	17 37.4	- 0 40.4	-0.4161	.5065	+.2032	+15	-69
ι Capricorni	4½	1.61	1.6	17 21.4	19 42.5	+ 1 21.0	-0.6741	.5055	.2059	+ 2	-90
γ Capricorni	3½	1.51	2.5	17 13.0	5 5 5.7	+10 27.9	+1.1582	.5009	.2176	+73	+23
44 Capricorni	6	1.46	1.8	14 57.6	6 43.9	-11 56.8	-0.9765	.5001	.2195	-14	-90
45 Capricorni	6	1.46	2.0	15 18.8	7 13.9	-11 27.6	-0.4772	.5000	.2201	+14	-74
δ Capricorni	3	+1.45	+ 2.7	-16 41.0	8 48.1	- 9 56.1	+1.3832	.4993	+.2218	+74	+53
μ Capricorni	5	1.39	2.2	14 7.8	12 11.4	- 6 38.6	-0.6805	.4979	.2255	+ 4	-90
ι Aquarii	4	1.32	3.0	14 27.9	19 18.6	+ 0 16.7	+1.3201	.4950	.2326	+76	+38
e² Aquarii	6½	1.28	2.5	12 10.1	21 37.3	+ 2 31.5	-0.6720	.4941	.2349	+ 6	-90
σ Aquarii	4½	1.16	3.1	11 18.3	6 8 36.8	-10 47.3	+1.0086	.4916	.2440	+79	+10
58 Aquarii	6	+1.16	+ 3.2	-11 32.0	9 10.8	-10 14.2	+1.3989	.4915	+.2445	+79	+50
67 Aquarii	6	1.05	2.4	7 36.3	15 36.6	- 3 59.0	-1.3341	.4905	.2492	-39	-90
λ Aquarii	4	1.01	3.2	8 14.0	20 48.6	+ 1 4.4	+0.6602	.4898	.2524	+82	-11
78 Aquarii	6	1.00	3.2	7 51.4	21 54.2	+ 2 8.2	+0.5234	.4897	.2531	+73	-18
81 Aquarii	6	0.96	3.3	7 43.2	7 1 42.2	+ 5 50.0	+1.3391	.4895	.2552	+83	+38
82 Aquarii	6	+0.94	+ 3.3	- 7 14.0	2 20.7	+ 6 27.4	+0.9683	.4894	+.2555	+83	+ 7
B. A. C. 8094	6	0.85	2.9	4 9.8	9 37.2	-10 27.9	-0.5200	.4893	.2590	+17	-76
11 Piscium	6½	0.77	2.9	2 28.0	17 20.8	- 2 56.9	-0.3581	.4900	.2617	+26	-64
14 Piscium	6	0.74	3.1	- 1 55.6	19 57.0	- 0 24.9	-0.2655	.4903	.2624	+30	-59
21 Piscium	6	0.65	3.1	+ 0 23.7	8 4 25.8	+ 7 49.9	-0.5528	.4920	.2641	+16	-78
25 Piscium	6	0.63	2.9	+ 1 24.5	6 25.3	+ 9 46.1	-1.1251	.4926	.2643	-18	-89
B. A. C. 8311	6½	+0.65	+ 3.6	- 0 34.5	7 21.3	+10 40.6	+1.2694	.4928	+.2643	+90	+29
51 Pisc., *mult.*	6	0.44	3.4	+ 6 16.7	9 3 44.1	+ 6 29.1	-0.7416	.5005	.2628	+ 6	-82
62 Piscium	6	0.40	3.9	6 37.8	12 7.6	- 9 21.9	+1.0747	.5050	.2599	+90	+16
δ Piscium	4½	0.40	3.8	6 55.0	12 20.0	- 9 9.8	+0.8215	.5051	.2598	+90	0
101 Piscium	6	0.20	4.3	14 2.0	10 12 12.2	-10 0.6	-0.7101	.5216	.2438	+ 7	-76
104 Piscium	6½	+0.20	+ 4.4	+13 39.8	13 54.7	- 8 21.3	+0.0965	.5230	+.2421	+49	-35

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MAY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 1648	6½	+0.35	+ 9.3	+27 50.0	**14** 10 50.5	+ 9 9.3	+0.1123	.5978	+.0372	+51	−12
β Tauri	2	0.36	9.5	28 30.2	12 48.6	+11 2.3	−0.5043	.5983	.0309	+16	−46
B. A. C. 1709	6½	0.37	9.6	29 5.3	14 3.7	−11 45.7	−1.0619	.5986	.0267	−23	−61
B. A. C. 1746	6½	0.41	9.2	27 35.0	16 26.0	− 9 29.4	+0.5206	.5992	.0188	+80	+11
B. A. C. 1772	6	0.43	9.5	29 8.7	17 39.4	− 8 19.1	−1.0438	.5995	+.0148	−21	−61
136 Tauri	5	+0.49	+ 9.1	+27 35.0	22 54.9	− 3 16.7	+0.5721	.6001	−.0029	+86	+15
B. A C. 1882	6½	0.50	9.5	28 55.4	**15** 0 5.3	− 2 9.3	−0.7907	.6001	.0065	− 2	−61
B. A. C. 2097	6½	0.67	8.9	28 17.6	12 41.7	+ 9 55.3	−0.4982	.5989	.0481	+16	−46
49 Aurigæ	5½	0.70	8.8	28 7.1	14 30.3	+11 39.3	−0.4146	.5985	.0540	+21	−42
54 Aurigæ	6	0.72	8.9	28 22.3	16 7.7	−10 47.3	−0.7626	.5981	.0593	0	−62
39 Geminor.	6½	+0 80	+ 8.0	+26 14.6	23 25.3	− 3 48.0	+0.8676	.5954	−.0829	+90	+25
40 Geminor.	6½	0.80	8.0	26 4.9	23 40.2	− 3 33.7	+1.0106	.5953	.0836	+90	+34
47 Geminor.	6	0.87	8.1	27 3.6	**16** 4 10.2	+ 0 45.0	−0.3841	.5933	.0976	+23	−43
α Geminorum.	5½	0.93	6.9	25 17.2	8 50.1	+ 5 13.6	+0.9162	.5908	.1117	+90	+25
B. A. C. 2514	6½	1.01	6.3	24 30.0	14 55.1	+11 3.8	+0.9763	.5871	.1295	+90	+27
c Geminorum	6	+1.06	+ 7.7	+26 4.6	16 48.1	−11 7.7	−0.8630	.5859	−.1346	− 6	−64
κ Gem., *mult.*	3½	1.04	6.1	24 41.6	16 57.6	−10 58.6	+0.5113	.5858	.1352	+78	0
ω² Cancri	6½	1.15	6.0	25 25.6	23 44.9	− 4 27.4	−1.2092	.5810	.1536	−34	−65
μ² Cancri	6	1.14	5.1	22 59.2	**17** 1 36.7	− 2 40.0	+0.9621	.5797	.1582	+90	+23
η Cancri	6	1.28	3.1	20 51.5	12 19.7	+ 7 38.2	+1.2700	.5712	.1844	+90	+47
39 Cancri	6	+1.32	+ 2.8	+20 26.5	15 23.0	+10 34.5	+1.1171	.5688	−.1912	+90	+31
40 Cancri	6	1.31	2.7	20 24.3	15 25.0	+10 36.5	+1.1468	.5687	.1914	+90	+33
γ Cancri	4½	1.35	3.0	21 54.6	16 40.7	+11 49.3	−0.6145	.5678	.1940	+11	−65
80 Cancri	6½	1.46	0.7	18 32.8	**18** 4 49.8	− 0 28 6	+0.2718	.5580	.2182	+60	−21
83 Cancri	6	1.50	0.0	18 13.5	7 52 5	+ 2 27.6	−0.0758	.5557	.2234	+40	−40
8 Leonis	6	+1.58	− 1.2	+16 59.3	15 47.6	+10 5.8	−0.6476	.5497	−.2363	+10	−72
Uranus				15 15.7	17 18.2	+11 33.3	+0.7401	.5481	2383	+90	0
ψ Leonis	6	1.58	2.5	14 35.0	18 47.7	−11 0.4	+1.0700	.5476	.2406	+90	+20
ν Leonis	5	1.64	3.7	13 1.8	**19** 1 19.8	− 4 41.7	+1.0414	.5431	.2493	+90	+17
α Leonis	1½	1.69	4.3	12 34.0	5 58.5	− 0 12.5	+0.3405	.5401	.2548	+64	−23
45 Leonis	6	+1.76	− 6.1	+10 23.2	14 54.0	+ 8 25.1	+0.2361	.5349	−.2635	+57	−29
ρ Leonis	4	1.78	6.5	9 56.2	17 19.3	+10 45.6	+0.0519	.5335	.2656	+47	−39
49 Leonis, *mult.*	6½	1.78	6.8	9 17.0	18 22.6	+11 46.9	+0.4348	.5330	.2664	+70	−20
37 Sextantis	6	1.81	8.3	7 1.1	23 36.9	− 7 9.0	+1.3295	.5304	.2702	+90	+38
c Leonis	5	1.89	9.1	6 45.6	**20** 6 36.7	− 0 22.8	−0.3118	.5276	.2743	+28	−60
79 Leonis	6	+1.95	−11.7	+ 2 4.7	17 53.1	+10 32.1	+1.3397	.5241	−.2783	+90	+37
τ Leonis	5	1.99	11.4	+ 3 31.8	19 46.2	−11 38.4	−0.6662	.5237	.2787	+10	−86
B. A. C. 4200	6	2.23	15.8	− 3 56.3	**22** 1 8.0	− 7 11.7	−1.1901	.5221	.2744	−23	−90
B. A. C. 4225	6½	2.23	16.0	4 22.7	2 58.9	− 5 24.3	−1.2457	.5223	.2735	−28	−90
f Virginis	6	2.26	16.4	5 9.5	5 29.9	− 2 58.0	−1.1301	.5228	.2721	−19	−90
χ Virginis	5	+2.26	−17.1	− 7 19.4	6 41.7	− 1 48.4	+0.7734	.5230	−.2714	+77	− 4
B A. C. 4259	6	2.26	17.1	7 21.6	6 45.6	− 1 44.6	+0.7925	.5230	.2714	+74	− 3
28 Virginis	6	2.28	17.1	6 49.7	8 1.0	− 0 31.5	−0.0944	.5232	.2706	+38	−49
ψ Virginis	5	2.33	17.9	8 52.5	14 2.5	+ 5 18.5	+0.3984	.5245	.2664	+65	−24
g Virginis	6	2.39	18.4	10 5.2	20 35.3	+11 38.9	−0.0775	.5262	.2610	+38	−48
50 Virginis	6	+2.40	−18.2	− 9 40.7	21 29.3	−11 28.9	−0.7352	.5264	−.2602	+ 4	−90
i Virginis	6	2.48	18.9	12 4.3	**23** 5 37.0	− 3 36.7	−0.3389	.5292	.2519	+23	−63
B. A. C. 4531	6	2.51	19.1	12 35.3	9 23.7	+ 0 2.7	−0.7480	.5305	.2477	+ 1	−90
83 Virginis	6	2.56	19.7	15 33.9	14 0.5	+ 4 30.5	+1.2156	.5324	.2419	+75	+27
85 Virginis	6	2.57	19.7	15 9.3	14 31.7	+ 5 0.7	+0.6631	.5326	.2411	+74	− 9
B. A. C. 4722	6	2.72	19.8	17 37.9	**24** 4 23.4	− 5 34.9	+0.0380	.5390	.2209	+39	−42
B. A. C. 4739	6½	+2.72	−19.7	−18 9.0	5 51.9	− 4 9.4	+0.2559	.5397	−.2186	+49	−31
B. A. C. 4923	6	2.92	19.3	20 51.9	23 19.0	−11 17.9	−0.4453	.5482	.1867	+10	−72
B. A. C. 5023	6	3.01	18.4	21 56.9	**25** 7 44.2	− 3 10.3	−0.8032	.5493	.1690	−12	−90
42 Libræ	5½	3.09	17.6	23 25.3	17 7.4	+ 5 50.7	−0.8845	.5563	.1477	−19	−90
B. A. C. 5197	6	3.15	17.5	24 19.9	20 30.4	+ 9 8.7	−0.2598	.5576	.1399	+14	−60
b Scorpii	5	+3.18	−17.3	−25 22.8	22 41.6	+11 15.2	+0.5518	.5585	−.1346	+57	−14

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MAY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.
		s	"	°	d h m	h m				°	°
A^2 Scorp., *mult.*	5	+3.18	-17.1	-24 57.8	25 23 50.0	-11 38.9	-0.0431	.5589	-.1317	+24	-47
B. A. C. 5253	6	3.17	17.1	24 10.1	23 58.4	-11 30.8	-0.9041	.5590	.1314	-22	-90
B. A. C. 5255	6	3.18	17.1	25 2.9	26 0 5.3	-11 24.1	+0.0142	.5590	.1312	+27	-43
3 Scorpii	6	3.18	17.1	24 53.0	0 17.1	-11 12.7	-0.1858	.5591	.1307	+17	-55
4 Scorpii	6	3.21	17.1	25 54.5	0 37.6	-10 53.0	+0.8570	.5592	.1297	+64	+ 5
B. A. C. 5286	6½	+3.18	-16.8	-24 29.3	1 58.6	- 9 34.9	-0.8245	.5597	-.1265	-17	-90
π Scorpii	3	3.21	16.9	25 45.8	2 3.8	- 9 29.9	+0.5193	.5597	.1263	+54	-15
B. A. C. 5314	6	3.22	16.7	25 31.5	3 59.5	- 7 38.4	+0.0284	.5604	.1216	+27	-43
B. A. C. 5347	5	3.25	16.4	26 0.0	6 0.7	- 5 41.6	+0.2935	.5609	.1165	+40	-28
σ Scorpii	3½	3.26	15.5	25 18.0	11 35.2	- 0 19.3	-1.0622	.5625	.1021	-36	-90
α Scorpii	1½	+3.31	-14.7	-26 9.7	15 2.9	+ 3 0.9	-0.4813	.5633	-.0929	- 2	-76
τ Scorpii	3½	3.35	14.5	27 57.8	17 44.5	+ 5 36.6	+1.2039	.5637	.0857	+62	+37
B. A. C. 5603	6½	3.38	13.9	28 16.9	21 34.9	+ 9 18.5	+1.2379	.5643	.0756	+62	+43
B. A. C. 5800	6½	3.38	11.9	26 50.3	27 9 55.0	- 2 48.5	-1.0354	.5648	.0417	-39	-90
43 Ophiuchi	6	3.43	11.0	28 1.5	13 43.7	+ 0 51.7	+0.1021	.5647	.0312	+22	-38
3 Sagittarii	5	+3.43	- 9.0	-27 47.1	23 56.9	+10 42.3	-0.3329	.5632	-.0031	- 3	-65
B. A. C. 6024	6½	3.40	9.0	27 1.3	28 1 9.2	+11 52.0	-1.1606	.5629	+.0002	-52	-90
B. A. C. 6063	6½	3.44	8.2	28 2.8	3 49.4	- 9 33.6	-0.0406	.5622	.0076	+13	-47
B. A. C. 6072	6½	3.45	8.0	28 44.5	4 37.7	- 8 47.1	+0.7186	.5620	.0098	+61	- 3
B. A. C. 6120	6½	3.43	7.4	28 22.3	8 6.2	- 5 26.2	+0.3683	.5609	.0189	+36	-23
B. A. C. 6127	5	+3.43	- 7.2	-28 28.3	8 39.3	- 4 56.2	+0.4871	.5607	+.0206	+44	-16
B. A. C. 6190	6½	3.43	6.5	28 41.5	12 38.2	- 1 4.0	+0.8306	.5593	.0313	+62	+ 5
B. A. C. 6191	6½	3.42	6.5	28 19.6	12 38.5	- 1 3.8	+0.4335	.5593	.0313	+41	-19
B. A. C. 6194	6	3.38	6.7	27 5.2	12 57.8	- 0 45.1	-0.9028	.5592	.0321	-31	-90
B. A. C. 6220	6½	3.42	6.0	28 29.3	14 37.4	+ 0 50.8	+0.6775	.5585	.0366	+59	- 5
φ Sagittarii	3½	+3.34	- 4.3	-27 7.0	29 0 55.3	+10 46.8	-0.3032	.5539	+.0633	+ 5	-63
σ Sagittarii	2½	3.31	3.6	26 26.9	5 9.9	- 9 7.6	-0.7430	.5512	.0763	-18	-90
τ Sagittarii	3½	3.32	2.1	27 50.9	10 18.7	- 4 9.6	+1.2001	.5489	.0863	+62	+37
B. A. C. 6562	6½	3.25	2.0	26 6.8	13 9.8	- 1 24.4	-0.4442	.5475	.0931	+ 1	-73
ψ Sagittarii	6	3.23	1.9	25 28.0	14 13.0	- 0 23.3	-1.0537	.5464	.0958	-35	-90
k^1 Sagittarii	6	+3.16	- 0.3	-24 59.2	23 32.4	+ 8 37.0	-0.5922	.5404	+.1165	- 5	-86
k^2 Sagittarii	4½	3.16	- 0.2	25 9.2	23 50.6	+ 8 54.5	-0.3739	.5402	.1171	+ 6	-68
B. A. C. 6864	6	3.01	+ 1.3	23 4.4	30 11 24.6	- 3 54.4	-1.1671	.5324	.1412	-40	-90
B. A. C. 6878	6½	3.00	1.4	22 56.3	12 31.4	- 2 49.8	-1.1574	.5316	.1435	-38	-90
4 Capricorni	6	2.92	2.5	22 11.3	19 22.4	+ 3 48.1	-0.9583	.5311	.1564	-22	-90
B. A. C. 7049	6	+2.89	+ 3.5	-22 47.8	31 0 57.2	+ 9 12.2	+0.6143	.5230	+.1664	+64	-10
17 Capricorni	6	2.79	4.5	21 57.5	9 12.6	- 6 47.7	+1.1202	.5175	.1792	+68	+23
20 Capricorni	6	2.66	4.9	19 30.6	16 2.3	- 0 10.5	-0.3216	.5129	.1906	+18	-63
η Capricorni	5½	+2.67	+ 5.7	-20 20.3	18 28.5	+ 2 11.4	+1.0641	.5114	+.1940	+70	+17

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.
30 Capricorni	6	+2.56	+ 6.0	-18 29.8	1 1 29.7	+ 9 0.0	+0.4224	.5072	+.2036	+58	-22
31 Capricorni	6½	2.54	5.9	17 58.4	1 39.8	+ 9 9.8	-0.1214	.5070	.2039	+30	-51
ι Capricorni	4½	2.51	6.0	17 21.3	3 45.0	+11 11.4	-0.3778	.5058	.2066	+17	-67
42 Capricorni	5	+2.34	+ 6.1	-14 35.6	14 0.0	- 2 51.5	-1.2531	.5003	+.2186	-36	-90
44 Capricorni	6	2.36	6.7	14 57.6	14 48.1	- 2 4.7	-0.6727	.4999	.2195	+ 4	-90
45 Capricorni	6	2.36	6.9	15 18.7	15 18.2	- 1 35.4	-0.1724	.4997	.2201	+30	-54
μ Capricorni	5	2.29	7.1	14 7.7	20 16.9	+ 3 14.7	-0.3731	.4974	.2253	+20	-66
e^1 Aquarii	6	2.15	7.3	11 25.4	2 5 42.9	-11 35.1	-1.1956	.4934	.2343	-28	-90
e^2 Aquarii	5½	2.16	7.6	12 10.0	5 45.6	-11 32.5	-0.3617	.4934	.2343	+22	-65
σ Aquarii	4½	+2.03	+ 8.4	-11 18.2	16 49.6	- 0 46.8	+1.3259	.4898	+.2430	+79	+38
67 Aquarii	6	1.91	7.9	7 36.2	23 52.8	+ 6 5.0	-1.0252	.4882	.2476	-13	-90
λ Aquarii	4	1.87	8.6	8 13.9	3 5 7.7	+11 11.4	+0.9741	.4873	.2507	+82	+ 8
78 Aquarii	6	1.85	8.6	7 51.3	6 13.9	-11 44.2	+0.8366	.4872	.2513	+82	- 1
82 Aquarii	6	1.80	8.6	7 13.9	10 42.9	- 7 22.5	+1.2814	.4867	.2536	+83	+31
B. A. C. 8094	6	+1.67	+ 8.2	- 4 9.7	18 4.0	- 0 13.3	-0.2170	.4864	+.2566	+32	-56

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JUNE.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
11 Piscium	6½	+1.60	+ 8.4	− 2 27.9	4 1 52.8	+ 7 22.9	−0.0602	.4867	+.2591	+41	−48
14 Piscium	6	1.56	8.4	− 1 55.5	4 30.7	+ 9 56.5	+0.0307	.4869	.2597	+46	−43
21 Piscium	6	1.46	8.2	+ 0 23.7	13 5.6	− 5 42.5	−0.2670	.4884	.2611	+31	−59
25 Piscium	6	1.43	8.0	1 24.6	15 6.6	− 3 44.8	−0.8447	.4889	.2613	0	−89
51 Pisc., *mult.*	6	1.20	7.9	6 16.7	5 12 41.0	− 6 46.1	−0.4904	.4967	.2593	+19	−72
62 Piscium	6	+1.12	+ 8.2	+ 6 37.8	21 10.5	+ 1 29.0	+1.3186	.5012	+.2563	+90	+37
δ Piscium	4½	1.12	8.2	6 55.0	21 23.0	+ 1 41.1	+1.0639	.5013	.2563	+90	+15
101 Piscium	6	0.89	7.6	14 2.0	6 21 29.0	+ 1 4.1	−0.5237	.5186	.2405	+17	−69
104 Piscium	6½	0.88	7.8	13 39.8	23 12.1	+ 2 44.0	+0.2796	.5200	.2389	+60	−25
B. A. C. 632	6	0.78	7.4	17 39.8	7 10 58.0	− 9 52.5	−1.1987	.5308	.2260	−27	−73
26 Arietis	6	+0.70	+ 7.6	+19 18.6	23 23.6	+ 2 8.4	−0.2153	.5430	+.2085	+33	−46
B. A. C. 782	6½	0.70	7.9	18 20.4	8 0 44.8	+ 3 27.0	+1.0786	.5445	.2063	+90	+24
μ Arietis	5½	0.66	7.7	19 29.3	4 38.7	+ 7 12.8	+0.6712	.5486	.1998	+90	+ 1
47 Arietis	6	0.66	8.0	20 10.6	11 30.3	−10 10.2	+1.2817	.5557	.1873	+90	+47
ε Arietis, *mult.*	4½	0.62	7.9	20 51.0	11 59.7	− 9 41.8	+0.6763	.5563	.1864	+90	+ 3
64 Arietis	6	+0.57	+ 7.6	+24 17.3	22 32.9	+ 0 28.2	−1.0198	.5673	+.1642	−16	−66
66 Arietis	6½	0.58	8.0	22 22.9	9 0 18.0	+ 2 9.4	+1.2263	.5691	.1603	+90	+44
7 Tauri, *mult.*	6	0.56	7.7	24 3.1	2 43.9	+ 4 29.8	−0.1086	.5716	.1545	+38	−34
η Tauri	3	0.55	8.1	23 43.5	8 1.4	+ 9 35.2	+1.0086	.5770	+.1414	+90	+28
A Geminorum	5½	0.87	6.3	25 17.2	12 16 36.0	− 9 12.7	+0.7521	.5996	−.1152	+90	+15
B. A. C. 2514	6½	+0.92	+ 6.1	+24 30.0	22 31.4	− 3 32.2	+0.7987	.5958	−.1333	+90	+16
c Geminorum	6	0.95	6.0	26 4.6	13 0 21.5	− 1 46.6	−1.0132	.5946	.1386	−16	−64
κ Gemi., *mult.*	3½	0.94	5.8	24 41.5	0 30.7	− 1 37.8	+0.3365	.5946	.1388	+65	− 9
μ^1 Cancri	6	1.00	4.7	22 59.2	8 56.2	+ 6 27.1	+0.7633	.5883	.1625	+90	+11
η Cancri	6	1.08	3.4	20 51.5	19 22.4	− 7 31.6	+1.0471	.5797	.1886	+90	+26
39 Cancri	6	+1.11	+ 3.1	+20 26.5	22 20.9	− 4 40.0	+0.8913	.5771	−.1955	+90	+15
40 Cancri	6	1.11	3.0	20 24.3	22 23.0	− 4 38.0	+0.9206	.5771	.1955	+90	+17
ε Cancri	6	1.10	3.0	19 58.7	22 29.7	− 4 21.6	+1.3231	.5770	.1957	+90	+55
42 Cancri	6½	1.11	3.0	20 9.2	22 36.2	− 4 25.4	+1.1277	.5769	.1959	+90	+31
B. A. C. 2925	6½	1.11	2.9	20 0.9	22 41.5	− 4 20.3	+1.2482	.5769	.1961	+90	+43
γ Cancri	4½	+1.14	+ 3.3	+21 54.6	23 36.7	− 3 27.2	−0.8207	.5761	−.1981	− 1	−68
80 Cancri	6½	1.23	1.1	18 32.9	14 11 27.9	+ 7 57.0	+0.0341	.5655	.2223	+46	−34
83 Cancri	6	1.26	0.7	18 13.5	14 26.4	+10 49.0	−0.3133	.5629	.2276	+27	−53
7 Leonis	6½	1.30	+ 1.0	14 55.6	21 42.5	− 6 10.7	+1.2853	.5567	.2392	+90	+40
8 Leonis	6	1.32	− 0.4	16 59.3	22 10.9	− 5 43.4	−0.8900	.5563	.2400	− 4	−73
URANUS				+14 59.0	15 1 3.2	− 2 57.2	+0.4199	.5527	−.2441	+69	−17
ψ Leonis	6	+1.32	− 1.5	14 35.0	1 7.2	− 2 53.4	+0.8054	.5538	.2443	+90	+ 3
ν Leonis	5	1.38	2.5	13 1.8	7 31.4	+ 3 17.4	+0.7694	.5488	.2528	+90	0
α Leonis	1½	1.42	3.1	12 34.0	12 4.8	+ 7 41.3	+0.0708	.5454	.2580	+48	−37
44 Leonis	6	1.48	4.9	9 24.5	19 45.7	− 8 53.6	+1.2354	.5400	.2653	+90	+30
B. A. C. 3562	6½	+1.47	− 4.9	+ 9 23.8	19 55.3	− 8 44.2	+1.2048	.5399	−.2655	+90	+27
45 Leonis	6	1.50	4.7	10 23.2	20 51.2	− 7 50.3	−0.0400	.5393	.2662	+42	−44
ρ Leonis	4	1.52	5.1	9 56.2	22 4.3	− 6 42.0	−0.2243	.5377	.2681	+33	−54
49 Leon., *mult.*	6	1.51	5.4	9 17.0	23 16.5	− 5 31.8	+0.1550	.5371	.2689	+53	−34
37 Sextantis	6	1.55	6.7	7 1.1	16 5 26.5	+ 0 27.9	+1.0406	.5341	.2724	+90	+13
c Leonis	5	+1.63	− 7.6	+ 6 45.6	12 21.2	+ 7 9.1	−0.5919	.5305	−.2759	+14	−79
75 Leonis	5½	1.67	9.7	2 41.0	20 16.2	− 9 11.2	+1.3428	.5271	.2784	+90	+38
79 Leonis	5½	1.70	10.2	2 4.8	23 31.3	− 6 2.3	+1.0510	.5259	.2790	+90	+12
τ Leonis	5	1.73	9.8	+ 3 31.8	17 1 23.8	− 4 13.3	−0.9464	.5253	.2793	− 6	−87
f Virginis	6	2.05	15.2	− 5 9.5	18 11 4.2	+ 4 23.7	−1.3785	.5227	.2794	−45	−90
χ Virginis	5	2.07	16.0	7 19.4	12 16.2	+ 5 33.5	+0.5147	.5213	.2694	+73	−18
B. A. C. 4259	6	+2.06	−16.1	− 7 21.5	12 20.2	+ 5 37.3	+0.5342	.5214	−.2698	+74	−17
28 Virginis	6	2.09	15.8	6 49.7	13 35.8	+ 6 50.6	−0.3520	.5215	.2685	+25	−64
B. A. C. 4312	6½	2.12	17.1	9 40.4	18 11.6	+11 17.7	+1.3589	.5219	.2651	+81	+41
ψ Virginis	5	2.14	16.8	8 52.5	19 39.1	−11 17.5	+0.1493	.5221	.2641	+50	−36
g Virginis	6	2.22	17.4	10 5.2	19 2 14.5	− 4 54.5	−0.3173	.5234	.2582	+25	−62
50 Virginis	6	+2.23	−17.4	− 9 40.6	3 8.9	− 4 1.8	−0.9758	.5236	−.2575	−11	−90

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JUNE.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
ι Virginis	6	+2.34	-18.2	-12 4.3	19 11 20.6	+ 3 54.3	-0.5654	.5258	-.2487	+12	-80
B. A. C. 4531	6	2.37	18.4	12 35.3	15 9.5	+ 7 35.9	-0.9703	.5271	.2443	-12	-90
83 Virginis	6	2.44	19.4	15 33.9	19 49.2	-11 53.3	+1.0104	.5287	.2384	+75	+12
85 Virginis	6	2.45	19.2	15 9.3	20 20.7	-11 22.9	+0.4563	.5289	.2378	+64	-21
B. A. C. 4722	6	2.65	19.8	17 37.9	20 10 22.2	+ 2 11.2	-0.1440	.5346	.2174	+30	-53
B. A. C. 4739	6½	+2.67	-19.8	-18 9.0	11 52.0	+ 3 38.1	+0.0773	.5353	-.2149	+40	-40
B. A. C. 4923	6	2.94	19.6	20 51.9	21 5 33.1	- 3 16.3	-0.5905	.5436	.1831	+ 2	-84
B. A. C. 4964	6	3.04	19.8	23 31.2	11 8.7	+ 2 7.8	+1.2314	.5466	.1718	+67	+35
B. A. C. 5023	6	3.06	19.3	21 56.9	14 5.3	+ 4 58.3	-0.9315	.5475	.1657	-20	-90
42 Libræ	5½	3.22	18.4	23 25.3	22 0 37.1	- 8 52.0	-0.9904	.5523	.1421	-26	-90
B. A. C. 5197	6	+3.27	-18.3	-24 20.0	3 2.0	- 6 32.2	-0.3557	.5533	-.1365	+ 9	-66
b Scorpii	5	3.32	18.3	25 22.8	5 15.1	- 4 23.7	+0.4663	.5542	.1312	+52	-18
A² Scorp., *mult.*	5	3.32	18.0	24 57.8	6 24.4	- 3 16.9	-0.1300	.5546	.1286	+20	-52
B. A. C. 5253	6	3.31	17.9	24 10.2	6 32.9	- 3 8.7	-0.9961	.5547	.1281	-28	-90
B. A. C. 5255	6	3.32	18.1	25 2.9	6 39.8	- 3 2.1	-0.0718	.5547	.1279	+22	-48
3 Scorpii	6	+3.32	-18.0	-24 53.1	6 51.8	- 2 50.4	-0.2728	.5548	-.1274	+12	-61
4 Scorpii	6	3.35	18.1	25 54.5	7 12.6	- 2 30.4	+0.7777	.5549	.1267	+64	0
B. A. C. 5286	6½	3.34	17.7	24 29.3	8 34.6	- 1 11.3	-0.9103	.5554	.1233	-23	-90
π Scorpii	3	3.37	17.9	25 45.8	8 39.9	- 1 6.2	+0.4417	.5555	.1231	+50	-20
B. A. C. 5314	6	3.39	17.6	25 31.6	10 37.2	+ 0 46.9	-0.0476	.5562	.1182	+23	-47
B. A. C. 5347	5	+3.43	-17.3	-26 0.0	12 39.9	+ 2 45.2	+0.2237	.5568	-.1132	+36	-32
σ Scorpii	3½	3.46	16.3	25 18.0	18 18.6	+ 8 11.7	-1.1275	.5585	.0991	-41	-90
α Scorpii	1½	3.55	15.9	26 9.7	21 48.9	+11 34.5	-0.5351	.5595	.0901	- 5	-82
τ Scorpii	3½	3.61	15.7	27 57.8	23 0 32.4	- 9 48.0	+1.1657	.5601	.0829	+62	+32
B. A. C. 5603	6½	3.67	15.0	28 16.9	4 25.4	- 6 3.4	+1.2081	.5609	.0727	+62	+38
B. A. C. 5800	6½	+3.74	-12.6	-26 50.3	16 53.3	+ 5 57.3	-1.0488	.5622	-.0394	-40	-90
43 Ophiuchi	6	3.81	11.9	28 1.5	20 44.2	+ 9 39.8	+0.1026	.5622	.0289	+22	-38
3 Sagittarii	5	3.86	9.7	27 47.1	24 7 3.6	- 4 24.3	-0.3117	.5613	.0009	- 2	-64
B. A. C. 6024	6½	3.84	9.4	27 1.3	8 15.5	- 3 14.0	-1.1395	.5612	-.0003	-50	-90
B. A. C. 6063	6½	3.90	8.9	28 2.8	10 56.8	- 0 38.6	-0.0091	.5605	+.0097	+15	-45
B. A. C. 6072	6½	+3.93	- 8.7	-28 44.5	11 45.5	+ 0 8.4	+0.7549	.5604	+.0121	+62	0
B. A. C. 6120	6½	3.93	7.9	28 22.3	15 15.5	+ 3 30.7	+0.4105	.5595	.0212	+39	-21
B. A. C. 6127	5	3.94	7.9	28 28.3	15 48.8	+ 4 2.8	+0.5312	.5594	.0226	+47	-14
B. A. C. 6190	6½	3.95	6.9	28 41.5	19 49.2	+ 7 54.6	+0.8839	.5582	.0334	+62	+ 9
B. A. C. 6191	6½	3.94	6.9	28 19.6	19 49.5	+ 7 54.9	+0.4853	.5582	.0334	+45	-16
B. A. C. 6194	6	+3.90	- 6.7	-27 5.2	20 8.9	+ 8 13.6	-0.8551	.5581	+.0342	-28	-90
B A. C. 6220	6½	3.95	6.4	28 29.3	21 49.1	+ 9 50.2	+0.7345	.5576	.0386	+62	- 2
φ Sagittarii	3½	3.93	4.2	27 7.0	25 8 10.1	- 4 10.8	-0.2273	.5534	.0651	+ 9	-58
σ Sagittarii	2½	3.91	3.2	26 26.9	12 25.7	- 0 4.2	-0.6595	.5514	.0757	-13	-90
B. A. C. 6562	6½	3.90	1.5	26 6.8	20 27.3	+ 7 40.9	-0.3424	.5472	.0950	+ 6	-66
ψ Sagittarii	6	+3.88	- 1.2	-25 28.0	21 30.7	+ 8 41.9	-0.9502	.5467	+.0974	-28	-90
χ¹ Sagittarii	6	3.84	- 0.4	24 44.7	26 1 56.2	-11 1.6	-1.2891	.5440	.1077	-59	-90
h¹ Sagittarii	6	3.84	+ 0.8	24 59.2	6 51.4	- 6 16.3	-0.4695	.5410	.1186	+ 2	-75
h² Sagittarii	4½	3.84	1.0	25 9.2	7 9.7	- 5 58.7	-0.2500	.5408	.1192	+13	-59
B. A. C. 6864	6	3.74	3.1	23 4.3	18 44.8	+ 5 13.5	-1.0207	.5333	.1433	-27	-90
B. A. C. 6878	6½	+3.73	+ 3.3	-22 56.3	27 19 51.6	+ 6 18.1	-1.0086	.5325	+.1455	-26	-90
4 Capricorni	6	3.67	4.7	22 11.2	2 43.1	-11 3.7	-0.7960	.5278	.1586	-11	-90
B. A. C. 7049	6	3.67	5.8	22 47.8	8 18.1	- 5 39.3	+0.7901	.5240	.1684	+68	0
17 Capricorni	6	3.58	7.3	21 57.5	16 33.8	+ 2 21.1	+1.3122	.5184	.1819	+68	+46
20 Capricorni	6	3.47	8.1	19 30.5	28 23 23.8	+ 8 58.5	-0.1197	.5140	.1924	+28	-51
η Capricorni	5½	3.49	8.5	20 20.3	1 50.1	+11 20.4	+1.2726	.5124	.1959	+70	+37
30 Capricorni	6	+3.38	+ 9.5	-18 29.7	8 51.8	- 5 50.3	+0.6424	.5080	+.2054	+70	-10
31 Capricorni	6½	3.35	9.5	17 58.4	9 1.9	- 5 40.5	+0.0976	.5078	.2057	+41	-39
ι Capricorni	4½	3.34	9.8	17 21.3	11 7.4	- 3 38.7	-0.1555	.5066	.2083	+29	-53
42 Capricorni	5	3.19	10.6	14 35.5	21 23.5	+ 6 19.7	-1.0179	.5008	.2202	-17	-90
44 Capricorni	6	3.19	10.8	14 57.5	22 11.7	+ 7 6.5	-0.4350	.5004	.2211	+17	-70
45 Capricorni	6	+3.19	+11.0	-15 18.7	22 41.8	+ 7 35.7	+0.0678	.5001	+.2216	+42	-41

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
JUNE.											
μ Capricorni	5	+3.12	+11.5	−14 7.6	**29** 3 41.3	−11 33.2	−0.1273	.4976	+.2266	+33	−51
ε¹ Aquarii	6	3.00	12.0	11 25.3	13 9.2	− 2 21.1	−0.9397	.4933	.2352	− 9	−90
ε² Aquarii	5½	3.00	12.2	12 10.0	13 11.9	− 2 18.5	−0.1038	.4933	.2352	+35	−50
67 Aquarii	6	2.78	13.1	7 36.1	**30** 7 24.9	− 8 35.3	−0.7520	.4972	.2479	+ 4	−90
λ Aquarii	4	2.75	13.9	8 13.8	12 42.1	− 3 26.6	+1.2604	.4861	.2507	+82	+29
78 Aquarii	6	+2.72	+13.8	− 7 51.2	13 48.8	− 2 21.7	+1.1228	.4859	+.2513	+82	+18
B. A. C. 7986	6	+2.69	+13.2	− 5 38.3	14 10.6	− 2 0.5	−1.2351	.4858	+.2514	−28	−90
JULY.											
B. A. C. 8094	6	+2.57	+13.9	− 4 9.6	**1** 1 45.2	+ 9 15.6	+0.0708	.4844	+.2559	+47	−41
11 Piscium	6½	2.48	14.0	2 27.8	9 39.1	− 7 3.1	+0.2294	.4842	.2580	+57	−32
14 Piscium	6	2.45	14.1	− 1 55.4	12 18.8	− 4 27.6	+0.3211	.4843	.2584	+62	−28
B. A. C. 8276	6½	2.33	13.5	+ 1 32.2	20 38.6	+ 3 38.8	−1.3228	.4851	.2593	−35	−89
21 Piscium	6	2.34	13.9	0 23.8	21 0.3	+ 4 0.0	+0.0219	.4852	.2593	+45	−43
25 Piscium	6	+2.32	+13.7	+ 1 24.7	23 2.9	+ 5 59.3	−0.5599	.4853	+.2593	+16	−78
51 Pisc., *mult.*	6	2.08	13.5	6 16.8	**2** 20 57.4	+ 3 18.2	−0.2130	.4920	.2564	+33	−55
δ Piscium	4½	2.01	13.7	6 55.1	**3** 5 48.5	+11 54.5	+1.3474	.4963	.2531	+90	+40
101 Piscium	6	1.77	12.1	14 2.1	**4** 6 22.0	+11 45.1	−0.2820	.5127	.2366	+29	−54
104 Piscium	6½	1.74	12.4	13 39.9	8 7.1	−10 33.0	+0.5261	.5141	.2349	+77	−12
4 Arietis	6	+1.70	+11.6	+16 20.8	12 32.4	− 6 15.8	−1.3026	.5178	+.2305	−38	−74
ι Arietis	6	1.65	11.5	17 13.2	17 1.9	− 1 54.8	−1.2028	.5218	.2257	−27	−73
B. A. C. 632	6	1.64	11.4	17 39.9	20 6.8	+ 1 4.3	−0.9833	.5247	.2221	−10	−73
θ Arietis	5½	1.57	11.0	19 20.1	**5** 2 57.3	+ 7 41.6	−1.2557	.5311	.2133	−34	−71
26 Arietis	6	1.53	11.1	19 18.7	8 46.4	−10 40.8	−0.0131	.5370	.2048	+44	−35
B. A. C. 782	6½	+1.52	+11.4	+18 20.4	10 9.1	− 9 20.9	+1.2877	.5385	+.2027	+90	+45
μ Arietis	5½	1.49	11.1	19 29.3	14 7.2	− 5 30.9	+0.8706	.5426	.1960	+90	+12
ε Arietis, *mult.*	4½	1.43	10.7	20 51.0	21 35.8	+ 1 42.3	+0.8608	.5505	.1829	+90	+13
64 Arietis	6	1.35	9.8	24 17.4	**6** 8 18.9	−11 57.7	−0.8680	.5622	.1609	− 5	−66
7 Tauri, *mult.*	6	1.32	9.9	24 3.2	12 33.2	− 7 52.8	+0.0399	.5656	.1537	+47	−26
11 Tauri	6	+1.32	+ 9.6	+24 56.0	15 8.8	− 5 23.0	−0.4829	.5694	+.1453	+18	−54
g Pleiadum	5½	1.30	9.8	23 54.2	16 49.0	− 3 46.6	+0.8164	.5712	.1412	+90	+16
b Pleiadum	4	1.30	9.9	23 43.7	16 51.0	− 3 44.7	+1.0021	.5712	.1411	+90	+27
m Pleiadum	7	1.30	9.7	24 27.2	16 57.2	− 3 38.7	+0.2693	.5713	.1410	+60	−13
e Pleiadum	5	1.31	9.8	24 4.9	16 58.7	− 3 37.3	+0.6546	.5713	.1409	+90	+ 7
c Pleiadum	5	+1.30	+ 9.8	+23 59.1	17 13.9	− 3 22.6	+0.7910	.5716	+.1402	+90	+15
d Pleiadum	5	1.29	9.9	23 34.0	17 26.7	− 3 10.3	+1.2511	.5719	.1397	+90	+50
η Tauri	3	1.30	9.9	23 43.5	17 54.7	− 2 43.4	+1.1516	.5723	.1387	+90	+39
f Pleiadum	4	1.29	9.9	23 40.7	18 35.7	− 2 4.0	+1.2939	.5730	.1370	+90	+57
h Pleiadum	5½	1.29	9.9	23 45.7	18 36.2	− 2 3.5	+1.2089	.5730	.1370	+90	+45
B. A. C. 1192	6	+1.29	+ 9.6	+25 12.5	19 2.0	− 1 38.7	−0.2195	.5735	+.1357	+32	−38
p Tauri	6	1.25	9.3	26 9.7	**7** 3 12.5	+ 6 12.7	−0.1727	.5817	.1146	+34	−34
φ Tauri, *mult.*	5½	1.23	9.0	27 3.4	6 55.0	+ 9 46.4	−0.6820	.5853	.1038	+ 6	−62
χ¹ Tauri	5½	1.22	9.3	25 20.4	7 49.0	+10 38.2	+1.1617	.5861	.1013	+90	+44
χ² Tauri	8½	1.22	9.3	25 20.7	7 49.3	+10 38.5	+1.1572	.5861	.1013	+90	+44
B. A. C. 1444	6	+1.20	+ 8.5	+28 22.6	14 57.4	− 6 30.8	−1.2788	.5924	+0.803	−55	−62
B. A. C. 1648	6½	1.15	7.6	27 49.9	**8** 5 47.8	+ 7 42.5	+0.1263	.6026	.0332	+52	−11
β Tauri	2	1.14	8.0	28 30.2	7 51.2	+ 9 41.0	−0.4919	.6037	.0262	+16	−45
B. A. C. 1709	6½	1.14	7.9	29 5.3	8 57.2	+10 43.8	−1.0527	.6043	+.0225	−21	−61
83 Cancri	6	1.22	+ 0.7	18 13.5	**11** 23 9.5	− 2 40.0	−0.4370	.5715	−.2328	+21	−60
7 Leonis	6½	1.22	− 0.6	14 55.6	**12** 6 14.8	+ 4 9.4	+1.1189	.5654	.2449	+90	+24
8 Leonis	6	+1.25	0.3	+16 59.3	6 42.3	+ 4 35.8	−1.0266	.5651	−.2455	−13	−73
ψ Leonis	6	1.25	1.0	14 35.0	9 33.5	+ 7 20.7	+0.6390	.5627	.2500	+87	− 6
URANUS				14 32.6	11 40.9	+ 9 23.5	+0.1444	.5592	.2517	+52	−31
ν Leonis	5	1.27	2.1	13 1.8	15 46.3	−10 40.0	+0.5921	.5577	.2584	+82	−10
α Leonis	1½	1.30	2.6	12 34.0	20 11.6	− 6 24.1	−0.1032	.5543	.2635	+39	−46
B. A. C. 3538	6½	+1.31	− 3.8	+ 9 34.8	**13** 2 18.4	− 0 30.3	+1.2221	.5498	−.2698	+90	+28

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JULY.

Star's—					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0.		Apparent Declination.	Washington Mean Time.		Hour Angle *H*	Y	x′	y′	N'n.	S'n.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
44 Leonis	6	+1.32	− 4.0	+ 9 24.5	13	3 38.6	+ 0 47.2	+1.0318	.5488	−.2711	+90	+14
B. A. C. 3562	6½	1.32	4.0	9 23.8		3 48.0	+ 0 56.3	+1.0014	.5487	.2712	+90	+12
45 Leonis	6	1 34	3.8	10 23.2		4 42.2	+ 1 48.5	−0.2272	.5481	.2719	+32	−54
ρ Leonis	4	1.35	4.3	9 56.2		7 1.0	+ 4 2.5	−0.4122	.4465	.2738	+23	−65
49 Leonis, *mult.*	6	1.35	4.3	9 17.0		8 1.5	+ 5 1.0	−0.0400	.5458	.2745	+43	−44
37 Sextantis	6	+1.37	− 5.6	+ 7 1.1		13 2.1	+ 9 51.3	+0.8260	.5427	−.2778	+90	0
c Leonis	5	1.43	6.3	6 45.6		19 44.6	− 7 39.9	−0.7912	.5388	.2811	+ 3	−75
B. A. C. 3836	6	1.45	7.9	2 56.2	14	1 51.1	− 1 45.6	+1.3023	.5357	.2830	+90	+33
75 Leonis	5½	1.45	8.2	2 41.0		3 25.8	− 0 14.0	+1.1092	.5349	.2834	+90	+17
76 Leonis	6	1.45	8.4	2 19.3		4 12.0	+ 0 30.7	+1.2537	.5346	.2835	+90	+28
79 Leonis	5½	+1.48	− 8.7	+ 2 4.8		6 35.6	+ 2 49.6	+0.8177	.5336	−.2838	+90	− 2
τ Leonis	5	1.51	8.4	+ 3 31.9		8 25.0	+ 4 35.4	−1.1543	.5328	.2840	−20	−87
ν Leonis	4½	1.51	9.9	− 0 8.9		12 40.7	+ 8 42.7	−1.3292	.5313	.5839	−36	−90
χ Virginis	5	1.80	14.4	7 19.4	15	18 27.7	−10 27.5	+0.2758	.5261	.2718	+58	−30
B. A. C. 4259	6	1.80	14.4	7 21.5		18 31.6	−10 23.8	+0.2954	.5261	.2717	+59	−29
28 Virginis	6	+1.82	−14.2	− 6 49.7		19 45.8	− 9 12.0	−0.5821	.5261	−.2708	+13	−81
B. A. C. 4312	6½	1.85	15.4	9 40.4	16	0 16.5	− 4 49.9	+1.1140	.5263	.2671	+81	+17
ψ Virginis	5	1.88	15.2	8 52.5		1 42.5	− 3 26.7	−0.0845	.5264	.2659	+38	−49
g Virginis	6	1.96	16.0	10 5.2		8 11.4	+ 2 49.8	−0.5455	.5270	.2597	+14	−78
50 Virginis	6	1.98	15.7	9 40.6		9 5.0	+ 3 41.6	−1.1984	.5271	.2588	−27	−90
i Virginis	6	+2.07	−16.9	−12 4.3		17 10.0	+11 31.1	−0.7881	.5284	−.2495	− 1	−90
73 Virginis	6	2.11	17.9	14 44.1		20 3.4	− 9 41.0	+1.2511	.5291	.2459	+75	+30
B. A. C. 4531	6	2.13	17.2	12 35.3		20 56.1	− 8 50.1	−1.1885	.5293	.2448	−29	−90
83 Virginis	6	2.19	18.2	15 33.9	17	1 32.8	− 4 22.3	+0.7840	.5305	.2386	+69	− 3
85 Virginis	6	2.20	18.1	15 9.2		2 4.0	− 3 52.1	+0.2337	.5306	.2380	+51	−32
B. A. C. 4722	6	+2.42	−19.0	−17 37.9		15 59.2	+ 9 35.7	−0.3520	.5371	−.2168	+18	−65
B. A. C. 4739	6½	2.45	19.1	18 9.0		17 28.5	+11 2.0	−0.1292	.5356	.2142	+29	−51
B. A. C. 4923	6	2.75	19.4	20 51.9	18	11 6.9	+ 4 4.9	−0.7761	.5423	.1815	− 8	−90
B. A. C. 4984	6	2.86	19.8	23 31.2		16 42.7	+ 9 27.2	+1.0512	.5445	.1701	+67	+18
B. A. C. 5023	6	2.89	19.1	21 56.9		19 39.5	−11 40.2	−1.1066	.5457	.1637	−32	−90
42 Libræ	5½	+3.09	−18.5	−23 25.3	19	6 13.1	− 1 28.6	−1.1521	.5498	−.1401	−39	−90
B. A. C. 5197	6	3.15	18.6	24 20.0		8 38.6	+ 0 51.8	−0.5138	.5506	.1345	+ 1	−78
b Scorpii	5	3.22	18.7	25 22.9		10 52.3	+ 3 0.8	+0.3121	.5514	.1293	+43	−27
A² Scor., *mult.*	5	3.20	18.5	24 57.8		12 2.0	+ 4 8.0	−0.2831	.5518	.1264	+12	−61
B. A. C. 5253	6	3.21	18.1	24 10.2		12 10.5	+ 4 16.2	−1.1508	.5519	.1262	−40	−90
B. A. C. 5255	6	+3.22	−18.4	−25 2.9		12 17.5	+ 4 22.9	−0.2243	.5519	−.1259	+15	−58
3 Scorpii	6	3.22	18.3	24 53.1		12 20.6	+ 4 34.7	−0.4252	.5520	.1255	+ 5	−72
4 Scorpii	6	3.25	18.6	25 54.5		12 50.4	+ 4 54.8	+0.6272	.5521	.1245	+61	− 9
B. A. C. 5286	6½	3.24	17.9	24 29.3		14 12.9	+ 6 14.3	−1.0619	.5526	.1211	−34	−90
π Scorpii	3	3.27	18.4	25 45.8		14 18.2	+ 6 19.4	+0.2920	.5526	.1211	+41	−28
B. A. C. 5314	6	+3.29	−18.0	−25 31.6		16 16.1	+ 8 13.1	−0.1952	.5532	−.1163	+15	−56
B. A. C. 5347	5	3.33	18.0	26 0.1		18 19.6	+10 12.3	+0.0795	.5539	.1111	+28	−40
σ Scorpii	3½	3.41	16.9	25 18.0	20	0 0.5	− 8 19.0	−1.2665	.5554	.0972	−56	−90
α Scorpii	1½	3.50	16.6	26 9.7		3 32.2	− 4 54.8	−0.6673	.5562	.0881	−12	−90
τ Scorpii	3½	3.57	16.5	27 57.8		6 16.9	− 2 16.0	+1.0418	.5568	.0811	+62	+20
B. A. C. 5603	6½	+3.63	−16.1	−28 17.0		10 11.7	+ 1 30.3	+1.0907	.5575	−.0709	+62	+25
B. A. C. 5800	6½	3.79	13.4	26 50.3		22 45.8	−10 22.8	−1.1540	.5586	.0375	−49	−90
43 Ophiuchi	6	3.87	12.8	28 1.5	21	2 38.7	− 6 38.3	+0.0072	.5586	−.0271	+17	−44
3 Sagittarii	5	3.98	10.6	27 47.1		13 2.6	+ 3 23.1	−0.3920	.5578	+.0008	− 6	−70
B. A. C. 6024	6½	3.99	10.1	27 1.3		14 16.1	+ 4 34.0	−1.2210	.5576	.0040	−57	−90
B. A. C. 6063	6½	4.05	9.9	28 2.9		16 58.9	+ 7 10.9	−0.0812	.5572	.0112	+11	−49
B. A. C. 6072	6½	+4.08	− 9.8	−28 44.5		17 47.9	+ 7 58.2	+0.6858	.5570	+.0133	+58	− 5
B. A. C. 6120	6½	4.11	9.0	28 22.3		21 19.7	+11 22.4	+0.3456	.5563	.0228	+35	−24
B. A. C. 6127	5	4.12	8.7	28 27.3		21 53.3	+11 54.8	+0.4674	.5562	.0241	+43	−18
B. A. C. 6190	6½	4.17	7.9	28 41.5	22	1 55.7	− 8 11.5	+0.8283	.5551	.0349	+62	+ 4
B. A. C. 6191	6½	4.15	7.8	28 19.6		1 56.1	− 8 11.1	+0.4284	.5551	.0349	+41	−20
B. A. C. 6194	6	+4.10	− 7.5	−27 5.2		2 15.6	− 7 52.2	−0.9158	.5550	+.0357	−32	−90

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JULY.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6220	6½	+4.18	− 7.4	−28 29.3	**22** 3 56.7	− 6 14.7	+0.6818	.5545	+.0401	+60	− 5
φ Sagittarii	3½	4.20	4.8	27 7.0	14 22.7	+ 3 49.3	−0.2665	.5508	.0664	+ 7	−61
σ Sagittarii	2½	4.21	3.6	26 26.9	18 40.3	+ 7 57.9	−0.6929	.5489	.0770	−15	90
τ Sagittarii	3½	4.28	2.5	27 50.9	23 52.4	−11 0.8	+1.2809	.5464	.0894	+62	+53
B. A. C. 6562	6½	4.24	1.6	26 6.8	**23** 2 45.2	− 8 13.9	−0.3617	.5449	.0963	+ 5	−67
ψ Sagittarii	6	+4.22	− 1.3	−25 28.0	3 49.0	− 7 12.3	−0.9696	.5444	+.0989	−29	−90
*h*¹ Sagittarii	6	4.22	+ 0.9	24 59.2	13 13.3	+ 1 53.0	−0.4713	.5393	.1199	+ 2	−75
*h*² Sagittarii	4½	4.24	1.0	25 9.2	13 31.7	+ 2 10.8	−0.2513	.5391	.1205	+13	−59
B. A. C. 6864	6	4.18	3.9	23 4.3	**24** 1 10.3	−10 33.6	−1.0046	.5321	.1446	−26	−90
B. A. C. 6878	6½	4.18	4.1	22 56.2	2 17.5	− 9 28.5	−0.9908	.5314	.1468	−25	−90
4 Capricorni	6	+4.14	+ 5.5	−22 11.2	9 10.6	− 2 48.6	−0.7661	.5271	+.1598	−10	−90
B. A. C. 7049	6	4.18	6.9	22 47.8	14 46.9	+ 2 37.1	+0.8325	.5236	.1698	+67	+ 2
20 Capricorni	6	4.03	9.8	19 30.5	**25** 5 55.0	− 6 42.7	−0.0552	.5140	.1939	+31	−47
η Capricorni	5½	4.05	10.3	20 20.2	8 21.5	− 4 20.6	+1.3434	.5125	.1975	+70	+50
30 Capricorni	6	3.96	11.7	18 29.7	15 24.0	+ 2 29.5	+0.7224	.5082	.1971	+72	− 6
31 Capricorni	6½	+3.95	+11.7	−17 58.4	15 34.1	+ 2 39.3	+0.1774	.5081	+.1973	+45	−35
ι Capricorni	4½	3.94	12.0	17 21.2	17 39.6	+ 4 40.7	−0.0731	.5069	.2199	+33	−48
42 Capricorni	5	3.79	13.5	14 35.5	**26** 3 56.5	− 9 19.8	−0.9213	.5013	.2219	−11	−90
44 Capricorni	6	3.81	13.7	14 57.4	4 44.7	− 8 33.0	−0.3358	.5009	.2228	+22	−64
45 Capricorni	6	3.82	13.8	15 18.6	5 14.9	− 8 3.7	+0.1682	.5007	.2233	+47	−35
μ Capricorni	5	+3.78	+14.6	−14 7.5	10 14.7	− 3 12.4	−0.0198	.4983	+.2284	+38	−45
*e*¹ Aquarii	6	3.66	15.6	11 25.2	19 43.2	+ 6 0.4	−0.8217	.4941	.2369	− 2	−90
*e*² Aquarii	5½	3.68	15.7	12 9.9	19 45.9	+ 6 3.0	+0.0164	.4941	.2369	+41	−43
67 Aquarii	6	3.49	17.4	7 36.1	**27** 14 0.5	− 0 12.2	−0.6111	.4878	.2492	+12	−83
λ Aquarii	4	3.47	18.2	8 13.7	19 18.3	+ 4 57.1	+1.4125	.4865	.2519	+82	+51
78 Aquarii	6	+3.46	+18.3	− 7 51.1	20 25.3	+ 6 2.3	+1.2759	.4862	+.2525	+82	+31
B. A. C. 7986	6	3.41	17.8	5 38.3	20 47.1	+ 6 23.5	−1.0889	.4862	.2526	−17	−90
B. A. C. 8094	6	3.32	18.7	4 9.5	**28** 8 24.0	− 6 18.1	+0.2322	.4843	.2567	+56	−32
11 Piscium	6½	3.25	19.0	2 27.7	16 20.1	+ 1 25.4	+0.3990	.4838	.2586	+67	−24
14 Piscium	6	3.21	19.1	− 1 55.3	19 0.8	+ 4 1.9	+0.4934	.4838	.2589	+73	−19
B. A. C. 8276	6½	+3.13	+19.0	+ 1 32.3	**29** 3 23.7	−11 48.5	−1.1535	.4841	+.2595	−20	−89
21 Piscium	6	3.13	19.3	0 23.9	3 45.5	−11 27.2	+0.1982	.4842	.2595	+55	−34
25 Piscium	6	3.13	19.1	1 24.8	5 49.1	− 9 26.9	−0.3853	.4845	.2594	+25	−66
51 Pisc., *mult*.	6	2.92	19.1	6 16.9	**30** 3 56.5	−11 55.2	−0.0292	.4896	.2555	+43	−55
η Piscium	3½	2.66	17.1	14 43.0	**31** 11 40.2	− 5 5.0	−1.3605	.5061	.2361	−45	−76
101 Piscium	6	+2.64	+17.4	+14 2.2	13 53.7	− 2 55.5	−0.1032	.5076	+.2341	+39	−45
104 Piscium	6½	2.63	17.7	13 40.0	15 40.9	− 1 11.5	+0.7132	.5089	.2325	+90	− 3
4 Arietis	6	+2.61	+16.8	+16 20.9	20 11.8	+ 3 11.2	−1.1376	.5123	+.2280	−21	−74
AUGUST.											
ι Arietis	6	+2.56	+16.4	+17 13.2	**1** 0 47.1	+ 7 38.2	−1.0394	.5159	+.2229	−14	−73
B. A. C. 632	6	2.55	16.4	17 40.0	3 56.2	+10 41.5	−0.8190	.5184	.2192	0	−73
θ Arietis	5½	2.45	15.7	19 20.2	10 56.3	− 6 31.6	−1.0995	.5244	.2101	−19	−71
26 Arietis	6	2.44	15.6	19 18.8	16 52.8	− 0 46.6	+0.1537	.5298	.2016	+53	−27
ν Arietis	5½	+2.42	+14.7	+21 26.0	20 42.1	+ 2 55.2	−1.3431	.5334	+.1957	−52	−69
μ Arietis	5½	2.40	15.4	19 29.4	22 22.7	+ 4 32.5	+1.0442	.5351	.1929	+90	+24
ε Arietis, *mult.*	4½	2.35	14.6	20 51.1	**2** 6 2.9	+11 57.2	+1.0280	.5426	.1796	+90	+24
64 Arietis	6	2.28	13.0	24 17.4	17 3.3	− 1 25.5	−0.7325	.5537	.1587	+ 4	−66
7 Tauri, *mult.*	6	2.26	12.9	24 3.2	21 24.5	+ 2 46.4	+0.1830	.5580	.1485	+55	−19
11 Tauri	6	2.24	12.4	24 56.0	**3** 0 4.3	+ 5 20.3	−0.3491	.5607	.1423	+25	−46
g Pleiadum	5½	+2.22	+12.7	+23 54.3	1 47.3	+ 6 59.6	+0.9654	.5618	+.1397	+90	+24
b Pleiadum	4	2.21	12.8	23 43.7	1 49.3	+ 7 1.5	+1.1527	.5625	.1381	+90	+39
m Pleiadum	7	2.22	12.5	24 27.3	1 55.6	+ 7 7.5	+0.4103	.5626	.1378	+70	− 6
e Pleiadum	5	2.22	12.6	24 5.0	1 57.2	+ 7 9.1	+0.8011	.5626	.1377	+90	+15
c Pleiadum	5	2.22	12.7	23 59.1	2 12.9	+ 7 24.3	+0.9386	.5629	.1372	+90	+23
η Tauri	3	+2.20	+12.7	+23 43.6	2 54.8	+ 8 4.6	+1.3029	.5635	+.1358	+90	+60

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

AUGUST.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 1192	6	+2.20	+12.3	+25 12.5	3 4 3.8	+ 9 11.0	−0.0867	.5648	+.1329	+39	−31
ρ Tauri	6	2.14	11.3	26 9.7	12 27.6	− 6 44.2	−0.0480	.5729	.1117	+41	−27
φ Tauri, *mult.*	5½	2.12	10.9	27 3.5	16 15.9	− 3 4.7	−0.5679	.5765	.1015	+12	−55
B. A. C. 1444	6	2.06	9.9	28 22.7	4 0 30.8	+ 4 50.6	−1.1800	.5837	.0782	−34	−62
B. A. C. 1648	6½	1.93	8.7	27 50.0	15 42.7	− 4 34.6	+0.2185	.5947	.0315	+58	− 6
β Tauri	2	+1.94	+ 8.3	+28 30.2	17 41.2	− 2 41.0	−0.4074	.5958	+.0250	+21	−39
B. A. C. 1709	6½	1.93	8.1	29 5.3	18 56.5	− 1 28.8	−0.9714	.5966	.0208	−15	−61
B. A. C. 1746	6½	1.90	8.3	27 35.0	21 18.8	+ 0 47.6	+0.5948	.5979	.0129	+88	+15
B. A. C. 1772	6	1.92	7.7	29 8.7	22 32.2	+ 1 57.9	−0.9725	.5984	+.0090	−15	−61
136 Tauri	5	1.85	7.6	27 35.0	5 3 46.5	+ 6 59.0	+0.6079	.6007	−.0082	+90	+16
B. A. C. 1882	6½	+1.86	+ 7.2	+28 55.4	4 56.4	+ 8 5.8	−0.7546	.6011	−.0124	0	−61
B. A. C. 2097	6½	1.76	6.0	28 17.5	17 23.3	− 3 59.0	−0.5321	.6037	.0544	+14	−49
49 Aurigæ	5½	1.75	5.9	28 7.1	19 9.9	− 2 17.0	−0.4593	.6038	.0604	+18	−45
54 Aurigæ	6	1.75	5.6	28 22.3	20 45.3	− 0 45.7	−0.8121	.6038	.0658	− 3	−62
39 Geminor.	6½	1.68	5.4	26 14.5	6 3 52.4	+ 6 3.2	+0.7556	.6034	.0896	+90	+18
40 Geminor.	6½	+1.67	+ 5.3	+26 4.8	3 57.9	+ 6 6.6	+0.8945	.6034	−.0906	+90	+26
47 Geminor.	6	1.65	4.7	27 3.5	8 29.1	+10 28.0	+0.8929	.6026	.1046	+90	+25
A Geminor.	5½	1.61	4.5	25 17.2	12 59.7	− 9 12.8	+0.7475	.6014	.1190	+90	+14
κ Gem., *mult.*	3½	1.57	+ 3.7	24 41.5	20 48.8	− 1 43.5	+0.3029	.5984	.1436	+63	−11
ε Leonis	5	1.36	− 5.7	6 45.6	10 5 18.7	+ 3 42.3	−0.8596	.5471	.2364	− 1	−83
B. A. C. 3836	6	+1.36	− 7.0	+ 2 55.3	11 14.3	+ 9 25.7	+1.2173	.5442	−.2885	+90	+25
75 Leonis	5½	1.36	7.2	2 41.0	12 46.8	+10 55.0	+1.0062	.5435	.2888	+90	+10
76 Leonis	6	1.36	7.3	2 19.3	13 31.5	+11 38.3	+1.1476	.5432	.2889	+90	+20
79 Leonis	5½	1.37	7.6	2 4.8	15 50.9	−10 7.1	+0.7161	.5423	.2893	+90	− 7
τ Leonis	5	1.40	7.5	+ 3 31.9	17 37.0	− 8 24.5	−1.2283	.5416	.2895	−26	−87
υ Leonis	4½	+1.39	− 8.6	− 0 8.8	21 44.8	− 4 25.2	+1.2134	.5400	−.2895	+90	+24
χ Virginis	5	1.57	12.7	7 19.3	12 2 34.9	− 0 32.5	+0.1577	.5350	.2769	+51	−36
B. A. C. 4259	6	1.57	12.7	7 21.5	2 38.7	− 0 28.9	+0.1767	.5350	.2768	+52	−35
28 Virginis	6	1.56	13.3	6 49.6	3 50.5	+ 0 40.6	−0.6882	.5350	.2758	+ 8	−90
B. A. C. 4312	6½	1.61	13.7	9 40.3	8 13.6	+ 4 55.0	+0.9806	.5350	.2719	+81	+ 8
ψ Virginis	5	+1.63	−13.6	− 8 52.5	9 35.9	+ 6 14.5	−0.2001	.5350	−.2707	+32	−56
g Virginis	6	1.70	14.3	10 5.2	15 52.7	−11 41.2	−0.6563	.5354	.2641	+ 8	−88
50 Virginis	6	1.71	14.2	9 40.6	16 44.7	−10 50.8	−1.2999	.5356	.2631	−36	−90
i Virginis	6	1.77	15.2	12 4.3	13 0 35.1	− 3 16.2	−0.8972	.5364	.2535	− 7	−90
75 Virginis	6	1.81	16.2	14 44.1	3 23.5	− 0 33.3	+1.1128	.5369	.2498	+75	+18
B. A. C. 4531	6	+1.83	−15.5	−12 35.2	4 14.7	+ 0 16.1	−1.2921	.5371	−.2486	−38	−90
83 Virginis	6	1.91	16.4	15 33.9	8 43.5	+ 4 36.0	+0.6521	.5380	.2420	+74	−10
85 Virginis	6	1.92	16.3	15 9.2	9 13.9	+ 5 5.4	+0.1093	.5381	.2413	+44	−38
B. A. C. 4722	6	2.08	17.3	17 37.8	22 47.2	− 5 48.9	−0.4678	.5416	.2193	+13	−73
B. A. C. 4739	6½	2.12	17.5	18 9.0	14 0 14.2	− 4 24.8	−0.2479	.5418	.2166	+23	−59
B. A. C. 4923	6	+2.40	−18.1	+20 51.8	17 20.6	+11 15.0	−0.8837	.5471	−.1830	−15	−90
B. A. C. 4984	6	2.52	18.8	23 31.2	22 59.2	− 6 26.8	+0.9281	.5487	.1711	+67	+ 9
B. A. C 5023	6	2.55	18.1	21 56.9	15 1 53.0	− 3 39.2	−1.2092	.5496	.1647	−41	−90
42 Libræ	5½	2.77	18.0	23 25.3	12 17.2	+ 6 22.9	−1.2520	.5528	.1382	−50	−90
B. A. C. 5107	6	2.82	18.2	24 20.0	14 40.7	+ 8 41.4	−0.6169	.5532	.1349	− 5	−89
b Scorpii	5	+2.87	−18.2	−25 22.8	16 52.8	+10 48.8	+0.2040	.5537	−.1295	+37	−33
A² Scorp., *mult.*	5	2.88	17.9	24 57.8	18 1.6	+11 55.1	−0.3865	.5540	.1266	+ 7	−69
B. A. C. 5253	6	2.89	17.7	24 10.2	18 10.0	−11 56.8	−1.2471	.5540	.1263	−50	−90
B. A. C. 5255	6	2.89	17.9	25 2.9	18 17.0	−11 50.1	−0.3282	.5541	.1261	+ 9	−64
3 Scorpii	6	2.89	17.8	24 53.1	18 28.9	−11 38.5	−0.5277	.5541	.1258	− 1	−80
4 Scorpii	6	2.92	18.2	25 54.5	18 49.4	−11 18.8	+0.5177	.5542	.1246	+55	−16
B. A. C. 5286	6½	+2.92	−17.5	−24 29.3	20 11.0	−10 0.2	−1.1590	.5545	−.1214	−41	−90
π Scorpii	3	2.94	18.0	25 45.8	20 16.4	− 9 55.0	+0.1855	.5545	.1211	+35	−34
B. A. C. 5314	6	2.97	17.6	25 31.6	22 12.9	− 8 2.7	−0.2972	.5550	.1162	+10	−63
B. A. C. 5347	5	3.02	17.7	26 0.0	16 0 15.1	− 6 4.8	−0.0231	.5554	.1111	+23	−46
α Scorpii	1½	3.21	16.8	26 9.7	9 22.9	+ 2 43.3	−0.7612	.5570	.0877	−17	−90
τ Scorpii	3½	+3.27	−17.0	−27 57.8	12 6.5	+ 5 20.9	+0.9404	.5573	−.0807	+62	+12

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

AUGUST.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 5603	6½	+3.35	−16.5	−28 17.0	**16** 15 59.9	+ 9 5.9	+0.9917	.5578	−.0704	+62	+16
B. A. C. 5800	6½	3.53	13.8	26 50.3	**17** 4 30.9	− 2 50.2	−1.2371	.5580	.0528	−57	−90
43 Ophiuchi	6	3.64	13.5	28 1.5	8 23.3	+ 0 53.7	−0.0773	.5580	−.0427	+13	−49
3 Sagittarii	5	3.80	11.4	27 47.1	18 46.8	+10 54.7	−0.4692	.5562	+.0013	−10	−76
B. A. C. 6063	6½	3.86	10.8	28 2.9	22 43.2	− 9 17.4	−0.1576	.5553	.0120	+ 7	−54
B. A. C. 6072	6½	+3.90	−10.8	−28 44.5	23 32.4	− 8 29.9	+0.6093	.5552	+.0143	+52	− 9
B. A. C. 6120	6½	3.94	9.9	28 22.3	**18** 3 4.4	− 5 5.6	+0.2725	.5543	.0233	+31	−29
B. A. C. 6127	5	3.95	9.8	28 28.3	3 38.1	− 4 33.0	+0.3945	.5542	.0249	+38	−22
B. A. C. 6190	6½	4.02	8.8	28 41.6	7 41.0	− 0 38.8	+0.7577	.5534	.0352	+62	0
B. A. C. 6191	6½	4.00	8.8	28 19.6	7 41.4	− 0 38.4	+0.3583	.5534	.0352	+37	−24
B. A. C. 6194	6	+3.96	− 8.2	−27 5.3	8 0.9	− 0 19.5	−0.9663	.5528	+.0362	−35	−90
B. A. C. 6220	6½	4.02	8.3	28 29.3	9 42.2	+ 1 18.1	+0.6128	.5523	.0402	+54	− 9
ϕ Scorpii	3½	4.12	5.6	27 7.0	20 10.2	+10 24.2	−0.3283	.5485	.0668	+ 4	−65
σ Sagittarii	2½	4.15	4.5	26 26.9	**19** 0 28.7	− 8 26.3	−0.7518	.5465	.0773	−18	−90
τ Sagittarii	3½	4.24	3.7	27 50.9	5 42.0	− 3 23.7	+1.2255	.5440	.0900	+62	+40
B. A. C. 6562	6½	+4.21	− 2.6	−26 6.8	8 35.7	− 0 36.0	−0.4160	.5427	+.0966	+ 2	−71
ψ Sagittarii	6	4.20	− 2.2	25 28.0	9 39.8	+ 0 25.9	−1.0228	.5421	.0991	−33	−90
h¹ Sagittarii	6	4.26	+ 0.2	24 59.2	19 6.6	+ 9 33.7	−0.5184	.5371	.1200	− 1	−79
h² Sagittarii	4½	4.26	0.2	25 9.2	19 25.1	+ 9 51.6	−0.2978	.5369	.1209	+11	−62
B. A. C. 6864	6	4.26	3.5	23 4.3	**20** 7 6.9	− 2 49.6	−1.0440	.5301	.1449	−29	−90
B. A. C. 6878	6½	+4.28	+ 3.7	−22 56.3	8 14.3	− 1 44.3	−1.0292	.5295	+.1470	−28	−90
4 Capricorni	6	4.28	5.4	22 11.2	15 9.2	+ 4 57.3	−0.7995	.5253	.1601	−11	−90
B. A. C. 7049	6	4.33	6.7	22 47.8	20 46.8	+10 24.3	+0.8041	.5218	.1700	+67	0
17 Capricorni	6	4.32	8.5	21 57.4	**21** 5 5.7	− 5 32.1	+1.3465	.5170	.1838	+68	+56
20 Capricorni	6	4.25	10.3	19 30.5	11 57.8	+ 1 7.5	−0.0734	.5131	.1943	+31	−49
η Capricorni	5½	+4.29	+10.6	−20 20.2	14 24.7	+ 3 30.0	+1.3277	.5117	+.1978	+70	+46
30 Capricorni	6	4.23	12.2	18 29.7	21 28.0	+10 20.9	+0.7109	.5078	.2075	+72	− 6
31 Capricorni	6½	4.21	12.3	17 58.3	21 38.2	+10 30.9	+0.1655	.5077	.2077	+45	−35
ι Capricorni	4½	4.21	12.7	17 21.2	23 43.9	−11 27.2	−0.0840	.5066	.2104	+32	−49
42 Capricorni	5	4.13	14.9	14 35.3	**22** 10 1.4	− 1 27.4	−0.9260	.5013	.2225	−11	−90
44 Capricorni	6	+4.14	+15.0	−14 57.4	10 49.7	− 0 40.5	−0.3399	.5008	+.2233	+22	−64
45 Capricorni	6	4.15	15.0	15 18.6	11 19.9	− 0 11.2	+0.1645	.5007	.2238	+47	−36
μ Capricorni	5	4.13	16.1	14 7.5	16 19.7	+ 4 40.2	−0.0201	.4984	.2290	+38	−45
e¹ Aquarii	6	4.05	17.6	11 25.2	**23** 1 48.0	−10 7.4	−0.8164	.4947	2376	− 2	−90
e² Aquarii	5½	4.06	17.5	12 9.9	1 50.7	−10 4.8	+0.0219	.4946	.2377	+42	−43
67 Aquarii	6	+3.94	+19.9	− 7 36.0	20 3.7	+ 7 38.5	−0.5958	.4889	+.2503	+12	−82
λ Aquarii	4	3.94	20.8	8 13.7	**24** 1 20.8	−11 12.9	+1.4315	.4877	.2530	+82	+58
78 Aquarii	6	3.92	20.9	7 51.1	2 27.6	−10 7.9	+1.2957	.4875	.2536	+82	+33
B. A. C. 7986	6	3.89	20.8	5 38.2	2 49.4	− 9 46.7	−1.0698	.4874	.2537	−15	−90
B. A. C. 8094	6	3.83	21.9	4 9.5	14 24.7	+ 1 30.1	+0.2567	.4857	.2579	+58	−31
11 Piscium	6½	+3.79	+22.5	− 2 27.9	22 19.6	+ 9 12.4	+0.4271	.4853	+.2597	+69	−23
14 Piscium	6	3.76	22.6	− 1 55.2	**25** 0 59.9	+11 48.4	+0.5224	.4853	.2601	+75	−18
B. A. C. 8276	6½	3.68	22.9	+ 1 32.4	9 21.8	− 4 3.0	−1.1233	.4856	.2606	−17	−53
21 Piscium	6	3.70	23.0	0 24.0	9 43.7	− 3 41.7	+0.2301	.4857	.2606	+57	−32
25 Piscium	6	3.69	23.2	1 24.8	11 47.0	− 1 41.6	−0.3538	4858	.2606	+26	−64
51 Pisc., *mult.*	6	+3.58	+23.7	+ 6 17.0	**26** 9 53.9	− 4 10.3	+0.0082	.4904	+.2561	+45	−43
η Piscium	3½	3.41	22.3	14 43.0	**27** 17 45.5	+ 2 47.6	−1.3289	.5050	.2356	−40	−76
101 Piscium	6	3.40	22.4	14 2.3	20 0.1	+ 4 59.2	−0.0640	.5064	.2337	+41	−43
104 Piscium	6½	3.39	22.5	13 40.1	21 48.3	+ 6 43.3	+0.7577	.5075	.2320	+90	0
4 Arietis	6	3.39	21.6	16 21.0	**28** 2 21.6	+11 8.4	−1.1061	.5105	.2272	−19	−74
ι Arietis	6	3.36	21.2	17 13.3	7 0.0	− 8 21.5	−1.0076	.5137	.2220	−12	−73
B. A. C. 632	6	+3.34	+21.1	+17 40.0	10 11.3	− 5 16.0	−0.7865	.5160	+.2181	+ 2	−65
θ Arietis	5½	3.31	20.3	19 20.2	17 17.0	+ 1 36.6	−1.0705	.5213	.2088	−17	−71
26 Arietis	6	3.29	20.2	19 18.8	23 20.1	+ 7 28.2	+0.1931	.5262	.2000	+55	−25
ν Arietis	5½	3.29	19.2	21 26.0	**29** 3 12.2	+11 12.9	−1.3195	.5294	.1941	−46	−69
μ Arietis	4½	3.26	19.9	19 29.5	4 54.6	−11 8.1	+1.0914	.5308	.1913	+90	+27
ε Arietis, *mult.*	4½	+3.23	+18.7	+20 51.1	12 43.5	− 3 34.6	+1.0750	.5376	+.1777	+90	+28

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

AUGUST.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
64 Arietis	6	+3.21	+16.7	+24 17.5	29 23 58.4	+ 7 17.2	−0.7075	.5474	+.1542	+ 5	−66
7 Tauri, *mult.*	6	3.18	16.4	24 3.3	30 4 25.7	+11 35.2	+0.2179	.5514	.1463	+57	−17
11 Tauri	6	3.15	15.8	24 56.1	7 9.7	− 9 46.7	−0.3215	.5538	.1403	+26	−44
g Pleiadum	5½	3.13	16.1	23 54.3	8 55.2	− 8 4.9	+1.0093	.5553	.1363	+90	+28
b Pleiadum	4	3.12	16.1	23 43.8	8 57.3	− 8 2.9	+1.1992	.5553	.1363	+90	+44
m Pleiadum	7	+3.14	+15.8	+24 27.3	9 3.8	− 7 56.7	+0.4474	.5554	+.1361	+73	− 3
e Pleiadum	5	3.12	15.9	24 6.0	9 5.4	− 7 55.1	+0.8433	.5554	.1361	+90	+17
c Pleiadum	5	3.14	16.0	23 59.2	9 21.5	− 7 39.6	+0.9829	.5557	.1354	+90	+26
B. A. C. 1192	6	3.13	15.3	25 12.6	11 15.3	− 5 49.9	−0.0562	.5573	.1310	+41	−29
p Tauri	6	3.10	14.1	26 9.8	19 53.0	+ 2 28.9	−0.0189	.5646	.1101	+43	−25
φ Tauri, *mult.*	5½	+3.07	+13.3	+27 3.5	23 47.9	+ 6 15.0	−0.5471	.5678	+.1000	+14	−54
B. A. C. 1444	6	3.01	11.8	28 22.7	31 8 17.7	− 9 34.7	−1.1706	.5744	.0768	−33	−62
B. A. C. 1648	6½	+2.86	+ 9.7	+27 50.0	23 58.8	+ 5 29.3	+0.2448	.5845	+.0306	+60	− 5

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
β Tauri	2	+2.85	+ 9.2	+28 30.2	1 2 1.3	+ 7 26.9	−0.3910	.5856	+.0241	+22	−38
B. A. C. 1709	6½	2.86	8.6	29 5.3	3 19.0	+ 8 41.5	−0.9640	.5863	.0201	−14	−61
B. A. C. 1746	6½	2.80	8.9	27 5.0	5 46.1	+11 2.6	+0.6256	.5873	.0126	+90	+17
B. A. C. 1772	6	2.81	8.0	29 8.7	7 1.9	−11 44.6	−0.9658	.5879	+.0086	−15	−61
136 Tauri	5	+2.73	+ 7.7	+27 35.0	12 26.7	− 6 33.0	+0.6369	.5900	−.0085	+90	+18
B. A. C. 1882	6½	2.74	7.1	28 55.4	13 38.9	− 5 23.8	−0.7468	.5904	.0123	+ 1	−61
B. A. C. 2097	6½	2.60	5.5	28 17.5	2 2 30.6	+ 6 56.2	−0.5236	.5931	.0535	+15	−48
49 Aurigæ	5½	2.57	5.3	28 7.1	4 20.7	+ 8 41.8	−0.4498	.5934	.0596	+19	−44
54 Aurigæ	6	2.55	4.9	28 22.3	5 59.2	+10 16.2	−0.8076	.5934	.0647	− 3	−62
39 Geminor.	6½	+2.44	+ 4.5	+26 14.5	13 18.9	− 6 42.4	+0.7809	.5933	−.0884	+90	+19
40 Geminor.	6½	2.44	4.4	26 4.8	13 34.9	− 6 26.9	+0.9219	.5933	.0800	+90	+27
47 Geminor.	6	2.40	3.5	27 3.5	18 5.2	− 2 7.8	−0.4966	.5926	.1031	+16	−50
A Geminorum	5½	2.31	3.3	25 17.2	22 44.0	+ 2 19.5	+0.7704	.5917	.1177	+90	+16
B. A. C. 2514	6½	2.27	2.4	24 29.9	3 4 45.6	+ 8 6.3	+0.7930	.5901	.1357	+90	+15
c Geminorum	6	+2.25	+ 1.7	+26 4.5	6 37.2	+ 9 53.4	−1.0402	.5895	−.1412	−18	−64
κ Gemi., *mult.*	3½	2.23	2.1	24 41.5	6 46.6	+10 2.3	+0.3205	.5894	.1415	+64	−11
μ^1 Cancri	6	2.12	1.2	22 59.1	15 16.1	− 5 48.7	+0.7143	.5862	.1656	+90	+ 8
η Cancri	6	1.98	+ 0.2	20 51.4	4 1 41.0	+ 4 11.3	+0.9545	.5813	.1927	+90	+19
30 Cancri	6	1.96	− 0.2	20 26.4	4 37.9	+ 7 1.2	+0.7878	.5797	.2001	+90	+ 8
40 Cancri	6	+1.95	− 0.1	+20 24.3	4 39.9	+ 7 3.2	+0.8166	.5797	−.2001	+90	+10
ε Cancri	6	1.94	0.1	19 58.7	4 46.5	+ 7 9.5	+1.2162	.5796	.2003	+90	+39
42 Cancri	6½	1.94	0.1	20 9.2	4 52.9	+ 7 15.6	+1.0216	.5796	.2005	+90	+23
B. A. C. 2925	6½	1.95	0.1	20 0.9	4 56.1	+ 7 18.7	+1.1410	.5795	.2008	+90	+31
γ Cancri	4½	1.97	0.7	21 54.6	5 52.7	+ 8 13.1	−0.9166	.5790	.2030	− 7	−68
80 Cancri	6½	+1.83	− 1.7	+18 32.8	17 31.0	− 4 35.6	−0.1097	.5725	−.2285	+38	−41
83 Cancri	6	1.80	2.0	18 13.5	20 24.8	− 1 48.3	−0.4625	.5709	.2341	+20	−61
7 Leonis	6½	1.77	2.5	14 55.5	5 3 27.4	+ 4 58.4	+1.0857	.5669	.2460	+90	+22
8 Leonis	6½	1.73	2.8	16 59.4	3 54.8	+ 5 24.8	−1.0549	.5667	.2476	−15	−73
ν Leonis	5	1.63	3.4	13 1.8	12 53.4	− 9 56.4	+0.5445	.5617	.2615	+78	−12
α Leonis	1½	+1.61	− 3.9	+12 34.0	17 14.5	− 5 44.8	−0.1538	.5594	−.2674	+36	−49
χ Virginis	5	1.43	11.5	− 7 19.3	8 12 38.6	+11 19.2	+0.1642	.5428	.2807	+52	−36
28 Virginis	6	1.44	11.5	6 49.5	13 52.1	−11 29.8	−0.6745	.5429	.2797	+ 8	−80
B. A. C. 4312	6½	1.45	12.3	9 40.3	18 7.3	− 7 23.3	+0.9775	.5431	.2759	+81	+ 7
ψ Virginis	5	1.46	12.2	8 52.4	18 34.0	− 6 59.5	+0.0759	.5432	.2755	+56	−40
g Virginis	6	1.51	12.8	10 5.1	9 1 34.8	− 0 11.0	−0.6397	.5440	.2681	+ 9	−86
50 Virginis	6	+1.51	−12.8	− 9 40.6	2 25.3	+ 0 37.8	−1.2747	.5441	−.2671	−34	−90
i Virginis	6	1.56	13.7	12 4.3	10 2.0	+ 7 58.9	−0.8752	.5455	.2576	− 6	−90
75 Virginis	6	1.58	14.2	14 44.0	12 45.3	+10 36.5	+1.1084	.5461	.2537	+74	+18
B. A. C. 4531	6	1.61	13.8	12 35.2	13 35.0	+11 24.5	−1.2642	.5462	.2526	−35	−90
83 Virginis	6	1.62	14.7	15 33.8	17 55.7	− 8 23.8	+0.6557	.5473	.2458	+74	−10
85 Virginis	6	+1.62	−14.6	−15 9.2	18 25.2	− 7 55.3	+0.1201	.5474	−.2450	+45	−38

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

SEPTEMBER.

Star's—						At Conjunction in R. A.									Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.		Washington Mean Time.			Hour Angle H		Y	x′	y′		N'n.	S'n.
		s	″	°	′	d	h	m	h	m					°	°
B. A. C. 4722	6	+1.77	−15.6	−17	37.8	**10**	7	33.5	+ 4	45.4	−0.4463	.5508	−.2227		+13	−72
B. A. C. 4739	6½	1.81	15.8	18	8.9		8	57.8	+ 6	6.7	−0.2287	.5512	.2201		+24	−58
B. A. C. 4923	6	2.04	16.5	20	51.8	**11**	1	45.7	- 1	41.1	−0.8650	.5559	.1855		−14	−90
B. A. C. 4984	6	2.13	17.1	23	31.2		7	1.9	+ 3	23.6	+0.9352	.5574	.1734		+67	+ 9
B. A. C. 5023	6	2.17	16.6	21	56.9		9	50.6	+ 6	6.2	−1.1725	.5581	.1669		−38	−90
42 Libræ	5½	+2.34	−16.5	−23	25.3		19	57.6	− 8	8.9	−1.2126	.5604	−.1424		−45	−90
B. A. C. 5197	6	2.38	16.7	24	19.9		22	17.3	- 5	54.3	−0.5862	.5609	.1366		− 3	−85
b Scorpii	5	2.44	17.0	25	22.8	**12**	0	26.0	− 3	50.3	+0.2244	.5612	.1309		+38	−32
A^2 Scor., *mult.*	5	2.45	16.7	24	57.8		1	33.0	− 2	45.8	−0.3581	.5614	.1281		+ 8	−67
B. A. C. 5253	6	2.45	16.5	24	10.1		1	41.2	− 2	38.2	−1.2081	.5614	.1278		−46	−30
B. A. C. 5255	6	+2.45	−16.7	−25	2.9		1	48.0	− 2	31.4	−0.3004	.5615	−.1276		+11	−63
3 Scorpii	6	2.47	16.7	24	53.0		1	59.6	− 2	20.1	−0.4972	.5615	.1271		+ 1	−77
4 Scorpii	6	2.49	16.9	25	54.5		2	19.7	− 2	0.8	+0.5346	.5615	.1261		+55	−15
B. A. C. 5286	6½	2.48	16.4	24	29.3		3	39.2	− 0	44.2	−1.1215	.5618	.1227		−38	−90
π Scorpii	3	2.50	16.9	25	45.8		3	44.3	− 0	39.3	+0.2068	.5618	.1224		+36	−33
B. A. C. 5314	6	+2.54	−16.7	−25	31.6		5	38.1	+ 1	10.3	−0.2696	.5621	−.1175		+11	−61
B. A. C. 5347	6	2.57	16.6	26	0.0		7	37.3	+ 3	5.1	+0.0117	.5623	.1122		+25	−44
α Scorpii	1½	2.75	15.8	26	9.7		16	32.6	+11	40.7	−0.7271	.5630	.0882		−16	−90
τ Scorpii	3½	2.82	16.2	27	57.8		19	12.7	− 9	45.2	+0.9559	.5631	.0814		+62	+13
B. A. C. 5603	6½	2.89	15.9	28	17.0		23	1.3	− 6	5.1	+1.0076	.5630	.0707		+62	+17
B. A. C. 5800	6½	+3.09	−13.7	−26	50.3	**13**	11	18.6	+ 5	45.0	−1.1976	.5620	−.0372		−53	−90
43 Ophiuchi	6	3.19	13.3	28	1.5		15	7.3	+ 9	25.2	−0.0483	.5614	−.0265		+14	−47
3 Sagittarii	5	3.37	11.6	27	47.1	**14**	1	21.9	− 4	42.6	−0.4364	.5591	+.0014		− 8	−73
B. A. C. 6024	6½	3.37	11.1	27	1.3		2	34.6	− 3	32.5	−1.2569	.5587	.0046		−61	−90
B. A. C. 6063	6½	3.44	11.0	28	2.9		5	15.5	− 0	57.5	−0.1274	.5578	.0119		+ 9	−52
B. A. C. 6072	6½	+3.47	−11.2	−28	44.5		6	4.1	− 0	10.7	+0.6343	.5576	+.0141		+54	− 8
B. A. C. 6120	6½	3.53	10.3	28	22.4		9	33.8	+ 3	11.4	+0.3001	.5564	.0234		+32	−27
B. A. C. 6127	5	3.53	10.3	28	28.3		10	7.1	+ 3	43.5	+0.4215	.5561	.0250		+40	−20
B. A. C. 6190	6½	3.60	9.6	28	41.6		14	7.7	+ 7	35.5	+0.7827	.5546	.0355		+62	+ 2
B. A. C. 6191	6½	3.60	9.5	28	19.6		14	8.0	+ 7	35.8	+0.3858	.5546	.0355		+39	−22
B. A. C. 6194	6	+3.56	− 8.9	−27	5.3		14	27.5	+ 7	54.6	−0.9480	.5545	+.0363		−34	−90
B A. C. 6220	6½	3.62	9.1	28	29.4		16	7.8	+ 9	31.3	+0.6386	.5538	.0407		+56	− 8
φ Sagittarii	3½	3.75	6.5	27	7.0	**15**	2	30.1	− 4	28.4	−0.2963	.5490	.0670		+ 5	−63
σ Sagittarii	2½	3.79	5.5	26	26.9		6	48.1	− 0	19.4	−0.7178	.5469	.0774		−16	−90
τ Sagittarii	3½	3.91	4.5	27	51.0		12	0.1	+ 4	41.8	+1.2503	.5440	.0897		+62	+44
B. A. C. 6562	6½	+3.89	− 3.4	−26	6.8		15	52.9	+ 8	28.7	−0.3834	.5424	+.0964		+ 4	−69
ψ Sagittarii	6	3.87	3.0	25	28.0		15	56.8	+ 8	30.4	−0.9881	.5418	.0989		−30	−90
h^1 Sagittarii	6	3.97	0.8	24	59.2	**16**	1	22.1	− 6	23.2	−0.4872	.5362	.1198		+ 1	−77
h^2 Sagittarii	4½	3.98	− 0.9	25	9.2		1	40.5	− 6	5.5	−0.2671	.5360	.1204		+12	−69
B. A. C. 6864	6	4.03	+ 2.4	23	4.4		13	21.7	+ 5	12.7	−1.0127	.5289	.1443		−27	−90
B. A. C. 6878	6½	+4.05	+ 2.7	−22	56.3		14	29.1	+ 6	18.0	−0.9982	.5282	+.1464		−25	−90
4 Capricorni	6	4.08	4.3	22	11.2		21	24.1	−11	0.3	−0.7704	.5240	.1593		−10	−90
B. A. C. 7049	6	4.15	5.4	22	47.8	**17**	3	1.9	− 5	33.1	+0.8291	.5205	.1694		+67	+ 2
20 Capricorni	6	4.15	9.3	19	30.5		18	14.0	+ 9	11.2	−0.0508	.5116	.1934		+32	−47
η Capricorni	5½	4.18	9.6	20	20.2		20	41.1	+11	33.9	+1.3477	.5104	.1969		+70	+51
30 Capricorni	6	+4.16	+11.5	−18	29.7	**18**	3	45.0	− 5	34.6	+0.7300	.5066	+.2062		+72	− 5
31 Capricorni	6½	4.14	11.5	17	58.4		3	55.1	− 5	24.8	+0.1853	.5065	.2068		+46	−34
ι Capricorni	4½	4.14	12.0	17	21.2		6	1.1	− 3	22.6	−0.0647	.5054	.2095		+33	−48
42 Capricorni	5	4.11	14.6	14	35.5		16	19.2	+ 6	37.8	−0.9095	.5005	.2217		−10	−90
44 Capricorni	6	4.13	14.6	14	57.4		17	7.5	+ 7	24.8	−0.3241	.5001	.2226		+22	−63
45 Capricorni	6	4.13	14.7	15	18.6		17	37.7	+ 7	54.0	+0.1795	.4999	.2231		+48	−35
μ Capricorni	5	+4.13	+15.8	−14	7.5		22	37.6	−11	14.5	−0.0074	.4978	+.2284		+39	−45
e^1 Aquarii	6	4.09	17.8	11	25.2	**19**	8	5.8	− 2	2.1	−0.8069	.4943	.2369		− 1	−90
e^2 Aquarii	5½	4.11	17.7	12	9.9		8	8.5	− 1	59.4	+0.0302	.4943	.2370		+42	−42
67 Aquarii	6	4.05	20.9	7	36.0	**20**	2	19.8	− 8	18.0	−0.5961	.4894	.2500		+12	−82
λ Aquarii	4	4.08	21.4	8	13.7		7	36.1	− 3	10.2	+1.4246	.4885	.2527		+82	+54
78 Aquarii	6	+4.07	+21.6	− 7	51.1		8	42.6	− 2	5.4	+1.2880	.4883	+.2533		+82	+32

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

SEPTEMBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
B. A. C. 7986	6	+4.03	+22.0	- 5 38.2	20 9 4.3	- 1 44.4	-1,0737	.4882	+.2535	-15	-90
B. A. C. 8094	6	4.03	23.5	4 9.4	20 36.8	+ 9 29.6	+0.2437	.4872	.2580	+57	-32
11 Piscium	6½	4.01	24.4	2 27.7	21 4 29.3	- 6 50.4	+0.4084	.4871	.2599	+67	-24
14 Piscium	6	4.00	24.5	- 1 55.2	7 8.7	- 4 15.3	+0.5018	.4872	.2603	+74	-19
B. A. C. 8276	6½	3.97	25.2	+ 1 32.4	15 27.4	+ 3 50.1	-1.1468	.4878	.2610	-19	-89
21 Piscium	6	+3.98	+25.3	+ 0 24.0	15 49.1	+ 4 11.2	+0.2036	.4879	+.2610	+56	-34
25 Piscium	6	3.98	25.4	1 24.9	17 51.7	+ 6 10.6	-0.3804	.4881	.2610	+25	-66
51 Pisc., *mult.*	6	3.96	26.7	6 17.1	22 15 48.6	+ 3 31.7	-0.0350	.4934	.2569	+42	-45
η Piscium	3½	3.95	26.1	14 43.1	23 23 25.5	+10 14.9	-1.3938	.5082	.2363	-53	-76
101 Piscium	6	3.95	26.1	14 2.4	24 1 39.2	-11 35.3	-0.1312	.5095	.2342	+38	-46
104 Piscium	6½	+3.94	+26.2	+13 40.1	3 26.7	- 9 50.9	+0.6883	.5106	+.2324	+90	- 4
4 Arietis	6	3.98	25.6	16 21.0	7 58.5	- 5 27.2	-1.1773	.5134	.2277	-24	-74
ι Arietis	6	3.95	25.1	17 13.4	12 35.3	- 0 58.8	-1.0827	.5164	.2224	-17	-73
B. A. C. 632	6	3.96	25.0	17 40.1	15 45.7	+ 2 5.8	-0.8638	.5186	.2184	- 3	-73
θ Arietis	5½	3.96	24.2	19 20.3	22 49.9	+ 8 56.8	-1.1529	.5236	.2090	-24	-71
26 Arietis	6	+3.96	+23.9	+19 18.9	25 4. 52.1	- 9 12.5	+0.1085	.5281	+.2002	+50	-29
μ Arietis	5½	3.95	23.3	19 29.6	10 26.3	- 3 49.0	+1.0062	.5322	.1912	+90	+21
ε Arietis, *mult.*	4½	3.96	22.3	20 51.2	18 15.7	+ 3 44.9	+0.9892	.5384	.1775	+90	+22
64 Arietis	6	3.99	20.2	24 17.5	26 5 32.9	- 9 20.8	-0.8046	.5475	.1553	- 1	-66
7 Tauri, *mult.*	6	3.97	19.7	24 3.3	10 2.0	- 5 1.1	+0.1229	.5509	.1456	+51	-22
11 Tauri	6	+3.97	+18.9	+24 56.1	12 47.0	- 2 22.0	-0.4221	.5529	+.1396	+21	-50
g Pleiadum	5½	3.95	19.1	23 54.4	14 33.4	- 0 39.4	+0.9154	.5543	.1356	+90	+22
b Pleiadum	4	3.94	19.2	23 43.8	14 35.5	- 0 37.3	+1.1071	.5543	.1355	+90	+35
m Pleiadum	7	3.97	19.0	24 27.4	14 42.0	- 0 31.0	+0.3507	.5544	.1353	+66	- 9
e Pleiadum	5	3.95	19.1	24 5.1	14 43.6	- 0 29.5	+0.7487	.5544	.1352	+90	+12
c Pleiadum	5	+3.94	+18.9	+23 59.2	14 59.8	- 0 13.9	+0.8888	.5546	+.1347	+90	+20
η Tauri	3	3.94	18.9	23 43.7	15 43.2	+ 0 28.0	+1.2601	.5552	.1328	+90	+52
B. A. C. 1192	6	3.95	18.1	25 12.6	16 54.7	+ 1 36.9	-0.1562	.5561	.1303	+35	-34
p Tauri	6	3.94	16.7	26 9.8	27 1 37.8	+10 1.0	-0.1216	.5625	.1090	+37	-31
φ Tauri, *mult.*	5½	3.94	15.7	27 3.6	5 35.8	-10 9.8	-0.6546	.5651	.0990	+ 7	-60
χ^1 Tauri	5½	+3.90	+16.1	+25 20.5	6 33.7	- 9 14.1	+1.2514	.5658	+.0964	+90	+55
χ^2 Tauri	8½	3.90	16.1	25 20.8	6 33.9	- 9 13.9	+1.2471	.5658	.0964	+90	+54
B. A. C. 1648	6½	3.79	10.9	27 50.0	28 6 12.7	-10 29.2	+0.1394	.5786	.0302	+53	-10
β Tauri	2	3.80	10.0	28 30.2	8 17.8	- 8 29.1	-0.5037	.5794	.0240	+15	-45
B. A. C. 1709	6½	3.79	9.7	29 5.3	9 37.3	- 7 12.7	-1.0832	.5800	.0197	-25	-61
B. A. C. 1746	6½	+3.74	+ 9.7	+27 35.0	12 8.0	- 4 48.0	+0.5248	.5808	+.0122	+81	+12
B. A. C. 1772	6	3.77	8.9	29 8.7	13 25.7	- 3 33.3	-1.0859	.5813	+.0083	-25	-61
136 Tauri	5	3.66	8.3	27 35.0	18 58.8	+ 1 46.5	+0.5369	.5827	-.0084	+82	+13
B. A. C. 1882	6½	3.70	7.5	28 55.4	20 13.0	+ 2 57.8	-0.8646	.5830	.0124	- 6	-61
B. A. C. 2097	6½	3.52	4.8	28 17.5	29 9 26.9	- 8 20.0	-0.6390	.5844	.0529	+ 8	-56
49 Aurigæ	5½	+3.49	+ 4.4	+28 7.0	11 20.3	- 6 31.1	-0.5644	.5844	-.0586	+12	-52
54 Aurigæ	6	3.48	4.0	28 22.2	13 1.9	- 4 53.6	-0.9273	.5843	.0638	-11	-62
39 Geminor.	6½	3.33	3.2	26 14.5	20 36.9	+ 2 23.2	+0.6861	.5836	.0868	+90	+14
40 Geminor.	6½	3.31	3.2	26 4.8	20 52.4	+ 2 38.1	+0.8295	.5836	.0874	+90	+22
47 Geminor.	6	3.28	1.7	27 3.5	30 1 31.7	+ 7 6.3	-0.6101	.5827	.1014	+10	-57
52 Geminor.	6	+3.21	+ 2.1	+25 5.8	2 52.8	+ 8 23.7	+1.2540	.5824	-.1052	+90	+54
A Geminc	5½	3.18	1.4	25 17.1	6 20.1	+11 43.3	+0.6778	.5815	.1153	+90	+10
B. A C. 2214	6½	3.08	+ 0.6	24 29.9	12 34.4	- 6 17.2	+0.7026	.5797	.1328	+90	+10
c Geminorum	6	3.09	- 0.4	26 4.5	14 29.9	- 4 26.3	-1.1593	.5791	.1381	-29	-64
κ Gem., *mult.*	3½	3.06	+ 0.1	24 41.5	14 39.6	- 4 17.0	+0.2234	.5790	.1387	+58	-15
μ^1 Cancri	6	+2.90	- 1.2	+22 59.1	23 27.4	+ 4 10.4	+0.6265	.5755	-.1620	+89	+ 3

OCTOBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
η Cancri	6	+2.71	- 2.7	+20 51.4	1 10 14.8	- 9 27.0	+0.8760	.5707	-.1886	+90	+14
39 Cancri	6	2.65	3.1	20 26.4	13 17.9	- 6 30.9	+0.7079	.5692	.1955	+90	+ 4
40 Cancri	6	+2.66	- 3.0	+20 24.2	13 20.0	- 6 28.9	+0.7371	.5692	-.1955	+90	+ 5

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

OCTOBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
ε Cancri	6	+2.65	− 2.9	+19 58.6	1 13 26.9	− 6 22.1	+1.1434	.5691	−.1960	+90	+32
42 Cancri	6½	2.65	3.0	20 9.1	13 33.5	− 6 15.8	+0.9458	.5691	.1962	+90	+18
B. A. C. 2925	6½	2.64	2.9	20 0.8	13 39.0	− 6 10.5	+1.0668	.5690	.1964	+90	+26
γ Cancri	4½	2.68	3.7	21 54.5	14 35.5	− 5 16.2	−1.0233	.5686	.1984	−15	−68
80 Cancri	6½	2.45	4.6	18 32.8	2 2 37.9	+ 6 19.3	−0.1956	.5627	.2236	+34	−46
83 Cancri	6	+2.42	− 5.1	+18 13.4	5 37.5	+ 9 12.3	−0.5512	.5613	−.2293	+15	−66
7 Leonis	6½	2.27	5.3	14 55.5	12 53.9	− 7 47.1	+1.0254	.5579	.2419	+90	+17
8 Leonis	6	2.30	6.0	16 59.3	13 22.1	− 7 20.0	−1.1439	.5577	.2427	−22	−73
ψ Leonis	6	2.23	5.8	14 34.9	16 17.3	− 4 31.1	+0.5374	.5562	.2474	+78	−11
ν Leonis	5	2.13	6.3	13 1.7	22 36.9	+ 1 35.1	+0.4862	.5534	.2568	+74	−15
URANUS				+12 54.5	3 2 43.0	+ 5 32.5	−0.4544	.5494	−.2621	+21	−65
α Leonis	1½	+2.09	− 6.8	12 33.9	3 5.4	+ 5 54.0	−0.2151	.5516	.2625	+33	−52
B. A. C. 3538	6½	1.99	6.9	9 34.8	9 14.2	+11 50.0	+1.1105	.5493	.2697	+90	+20
44 Leonis	6	1.98	7.0	9 24.4	10 34.6	−10 52.4	+0.9194	.5489	.2710	+90	+ 7
B. A. C. 3562	6½	1.98	7.0	9 23.7	10 43.9	−10 43.5	+0.8888	.5489	.2712	+90	+ 5
45 Leonis	6	+1.99	− 7.3	+10 23.2	11 38.1	− 9 51.1	−0.3389	.5486	−.2721	+27	−60
ρ Leonis	4	1.96	7.6	9 56.2	13 56.6	− 7 37.5	−0.5234	.5479	.2744	+17	−72
49 Leon., *mult.*	6	1.95	7.5	9 17.0	14 56.8	− 6 39.3	−0.1519	.5475	.2753	+36	−50
37 Sextantis	6	1.87	7.7	7 1.1	19 55.2	− 1 51.2	+0.7109	.5461	.2795	+90	− 6
c Leonis	5	1.81	8.5	6 45.6	4 2 31.9	+ 4 31.9	−0.8954	.5445	.2838	− 3	−83
B. A. C. 3886	6	+1.75	− 8.5	+ 2 55.3	8 30.6	+10 18.3	+1.1959	.5435	−.2867	+90	+24
75 Leonis	5½	1.74	8.7	2 41.0	10 3.0	+11 47.6	+0.9886	.5433	.2872	+90	+ 9
76 Leonis	6	1.73	8.6	2 19.3	10 47.8	−11 29.1	+1.1314	.5432	.2875	+90	+19
79 Leonis	6	1.72	8.9	+ 2 4.8	13 7.4	− 9 14.3	+0.7015	.5430	.2882	+90	− 8
B. A. C. 4923	6	1.80	14.8	−20 51.8	8 11 31.6	+ 9 52.9	−0.7340	.5640	.1871	− 6	−90
B. A. C. 4984	6	+1.85	−15.4	−23 31.1	16 44.1	− 9 7.1	+1.0411	.5657	−.1749	+67	+17
B. A. C. 5023	6	1.89	15.1	21 56.9	19 28.8	− 6 27.6	−1.0421	.5665	.1683	−27	−90
42 Libræ	5½	2.02	15.0	23 25.2	9 5 20.7	+ 3 1.2	−1.0723	.5691	.1435	−33	−90
B. A. C. 5197	6	2.06	15.1	24 19.9	7 37.0	+ 5 13.4	−0.4507	.5696	.1375	+ 4	−73
b Scorpii	5	2.09	15.1	25 22.8	9 42.4	+ 7 14.0	+0.3529	.5700	.1326	+45	−25
A² Scorp., *mult.*	5	+2.10	−15.0	−24 57.7	10 47.8	+ 8 16.9	−0.2224	.5702	−.1293	+15	−57
B. A. C. 5253	6	2.11	14.9	24 10.1	10 55.8	+ 8 24.6	−1.0629	.5702	.1288	−33	−90
B. A. C. 5255	6	2.11	15.1	25 2.9	11 2.3	+ 8 30.9	−0.1651	.5702	.1285	+16	−54
3 Scorpii	6	2.12	15.0	24 53.0	11 13.7	+ 8 41.9	−0.3596	.5703	.1283	+ 8	−67
4 Scorpii	6	2.12	15.2	25 54.5	11 33.2	+ 9 0.6	+0.6611	.5703	.1272	+62	− 7
B. A. C. 5286	6½	+2.13	−14.8	−24 29.3	12 50.7	+10 15.3	−0.9750	.5705	−.1237	−27	−90
π Scorpii	3	2.12	15.1	25 45.7	12 55.7	+10 20.1	+0.3386	.5705	.1234	+43	−25
B. A. C. 5314	6	2.17	15.0	25 31.5	14 46.6	−11 53.2	−0.1311	.5708	.1186	+18	−52
B. A. C. 5347	5	2.20	15.0	26 0.0	16 42.8	−10 1.5	+0.1379	.5710	.1131	+32	−36
σ Scorpii	3½	2.28	14.3	25 18.0	22 4.4	− 4 52.1	−1.1612	.5714	.0984	−44	−90
α Scorpii	1½	+2.35	−14.3	−26 9.7	10 1 24.6	− 1 39.4	−0.5754	.5715	−.0892	− 7	−85
τ Scorpii	3½	2.40	14.5	27 57.8	4 0.7	+ 0 50.7	+1.0904	.5715	.0819	+62	+24
B. A. C. 5603	6½	2.49	14.2	28 16.9	7 43.6	+ 4 25.1	+1.1439	.5714	.0712	+62	+30
B. A. C. 5800	6½	2.65	12.6	26 50.3	19 43.3	− 8 2.5	−1.0290	.5697	.0369	−39	−90
43 Ophiuchi	6	2.73	12.5	28 1.5	23 26.7	− 4 27.5	+0.1094	.5689	−.0264	+22	−38
3 Sagittarii	5	+2.88	−10.9	−27 47.1	11 9 27.9	+ 5 11.1	−0.2702	.5658	+.0018	0	−61
B. A. C. 6024	6½	2.89	10.6	27 1.3	10 39.1	+ 6 19.7	−1.0814	.5654	.0051	−46	−90
B. A. C. 6063	6½	2.96	10.5	28 2.9	13 16.7	+ 8 51.4	+0.0378	.5643	.0123	+17	−42
B. A. C. 6072	6½	2.99	10.6	28 44.5	14 4.4	+ 9 37.4	+0.7916	.5640	.0145	+61	+ 2
B. A. C. 6120	6½	3.04	9.9	28 22.4	17 30.0	−11 4.7	+0.4625	.5625	.0238	+43	−18
B. A. C. 6127	5	3.05	10.0	28 28.3	18 2.7	−10 33.1	+0.5826	.5623	.0254	+51	−11
B. A. C. 6190	6½	+3.11	− 9.3	−28 41.6	21 58.7	− 6 45.7	+0.9421	.5604	+.0360	+62	+13
B. A. C. 6191	6½	3.10	9.2	28 19.6	21 59.1	− 6 45.4	+0.5502	.5604	.0360	+49	−13
B. A. C. 6194	6	3.07	8.8	27 5.3	22 18.2	− 6 26.9	−0.7720	.5602	.0368	−23	−90
B. A. C. 6220	6½	3.15	8.9	28 29.4	23 56.7	− 4 52.1	+0.8007	.5594	.0412	+62	+ 3
φ Sagittarii	3½	3.30	6.6	27 7.0	12 10 9.6	+ 4 58.8	−0.1229	.5537	.0677	+14	−31
σ Sagittarii	2½	+3.31	− 5.7	−26 26.9	14 22.8	+ 9 3.0	−0.5400	.5511	+.0780	− 6	−82

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

OCTOBER.

STAR'S—					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.
		s	"	° '	d h m	h m				°	°
B. A. C. 6562	6½	+3.42	− 4.1	−26 6.8	12 22 21.1	− 7 15.4	−0.2073	.5458	+.0970	+13	−57
ψ Sagittarii	6	3.41	3.6	25 28.1	23 24.1	− 6 14.7	−0.8074	.5451	.0993	−19	−90
χ^1 Sagittarii	6	3.44	2.4	24 44.8	13 3 48.7	− 1 59.0	−1.1347	.5422	.1093	−41	−90
χ^2 Sagittarii	6½	3.44	2.5	24 39.2	3 51.8	− 1 56.1	−1.2306	.5421	.1095	−50	−90
h^1 Sagittarii	6	3.51	1.7	24 59.2	8 43.1	+ 2 45.4	−0.3099	.5388	.1202	+10	−63
h^2 Sagittarii	4½	+3.53	− 1.7	−25 9.2	9 1.4	+ 3 3.0	−0.0914	.5386	+.1208	+21	−49
B. A. C. 6864	6	3.61	+ 1.3	23 24.4	20 36.4	− 9 44.9	−0.8337	.5305	.1443	−15	−90
B. A. C. 6878	6½	3.61	1.5	22 56.3	21 43.4	− 8 40.1	−0.8194	.5297	.1467	−14	−90
4 Capricorni	6	3.66	3.1	22 11.3	14 4 35.7	− 2 1.1	−0.5944	.5250	.1592	0	−85
B. A. C. 7049	6	3.74	4.1	22 47.8	10 11.7	+ 3 24.3	+0.9963	.5212	.1689	+67	+13
20 Capricorni	6	+3.79	+ 8.0	−19 30.5	15 1 20.9	− 5 54.2	+0.1148	.5113	+.1927	+41	−38
θ Capricorni	4	3.77	9.1	17 43.1	4 37.9	− 2 43.1	−1.2243	.5094	.1970	−37	−90
30 Capricorni	6	3.83	10.1	18 29.7	10 51.1	+ 4 19.1	+0.8882	.5059	.2055	+72	+ 5
31 Capricorni	6½	3.82	10.2	17 58.4	11 1.0	+ 3 28.8	+0.3449	.5058	.2057	+54	−26
ι Capricorni	4½	3.83	10.8	17 21.1	13 7.1	+ 5 31.1	+0.0947	.5046	.2084	+41	−39
42 Capricorni	5	+3.84	+13.5	−14 35.5	23 25.0	− 8 28.8	−0.7563	.4995	+.2203	− 1	−90
44 Capricorni	6	3.86	13.4	14 57.5	16 0 13.3	− 7 41.8	−0.1729	.4992	.2212	+30	−54
45 Capricorni	6	3.86	13.4	15 18.6	0 43.5	− 7 12.5	+0.3293	.4989	.2617	+56	−27
μ Capricorni	5	3.88	14.6	14 7.5	5 43.6	− 2 20.9	+0.1385	.4968	.2267	+47	−37
e^1 Aquarii	6	3.87	16.8	11 25.2	15 12.2	+ 6 51.9	−0.6688	.4932	.2354	+ 6	−89
e^2 Aquarii	5½	+3.89	+16.5	−12 9.9	15 14.8	+ 6 54.4	+0.1668	.4932	+.2354	+49	−35
67 Aquarii	6	3.92	20.4	7 36.0	17 9 26.6	+ 0 36.5	−0.4802	.4886	.2447	+18	−73
78 Aquarii	6	3.96	21.1	7 51.1	15 49.5	+ 6 49.1	+1.3922	.4884	.2517	+82	+46
B. A. C. 7986	6	3.93	21.7	5 38.2	16 11.1	+ 7 10.1	−0.9658	.4876	.2518	− 9	−90
B. A. C. 8094	6	3.94	23.6	4 9.4	18 3 42.9	− 5 36.6	+0.3323	.4869	.2564	+63	−27
11 Piscium	6½	+3.98	+24.5	− 2 27.7	11 34.4	+ 2 2.2	+0.4837	.4873	+.2585	+73	−19
14 Piscium	6	3.99	24.7	− 1 55.2	14 13.3	+ 4 36.9	+0.5725	.4875	.2589	+79	−15
B. A. C. 8276	6½	3.99	26.1	+ 1 32.4	22 30.3	−11 19.4	−1.0862	.4886	.2597	−15	−89
21 Piscium	6	4.00	25.9	0 24.0	22 51.9	−10 58.3	+0.2601	.4887	.2598	+58	−31
22 Piscium	6½	3.99	26.3	2 15.3	19 0 16.5	− 9 36.0	−1.4119	.4890	.2598	−49	−88
25 Piscium	6	+4.00	+26.1	+ 1 24.9	0 54.0	− 8 59.5	−0.3263	.4891	+.2598	+27	−62
51 Pisc., *mult.*	6	4.09	28.0	6 17.1	22 42.6	−11 46.7	−0.0216	.4955	.2561	+43	−44
101 Piscium	6	4.25	28.2	14 2.4	21 8 11.6	− 3 15.4	−0.1795	.4997	.2343	+34	−49
104 Piscium	6½	4.25	28.1	13 40.2	9 57.6	− 1 32.5	+0.6327	.5149	.2324	+86	− 7
4 Arietis	6	4.28	28.0	16 21.1	14 25.9	+ 2 47.6	−1.2317	.5180	.2277	−30	−74
ι Arietis	6	+4.31	+28.0	+17 13.4	18 59.0	+ 7 12.4	−1.1455	.5212	+.2225	−23	−73
B. A. C. 632	6	4.33	27.7	17 14.0	22 6.8	+10 14.4	−0.9330	.5234	.2186	− 7	−73
θ Arietis	5½	4.39	27.1	19 20.3	22 5 4.9	− 7 0.7	−1.2328	.5287	.2094	−32	−71
26 Arietis	6	4.41	26.5	19 18.9	11 2.0	− 1 15.0	+0.0125	.5334	.2003	+45	−34
B. A. C. 782	6½	4.42	26.4	18 20.7	12 26.8	+ 0 7.0	+1.3323	.5345	.1980	+90	+53
μ Arietis	5½	+4.43	+26.0	+19 29.6	16 31.3	+ 4 3.5	+0.8964	.5378	+.1913	+90	+14
ε Arietis, *mult.*	4½	4.49	25.0	20 51.2	23 0 14.0	+11 30.6	+0.8654	.5439	.1775	+90	+14
64 Arietis	6	4.60	23.0	24 17.6	11 21.9	− 1 44.5	−0.9367	.5527	.1552	−10	−66
7 Tauri, *mult.*	6	4.61	22.2	24 3.4	15 47.5	+ 2 31.7	−0.0191	.5561	.1456	+43	−29
11 Tauri	6	4.62	21.6	24 56.2	18 30.5	+ 5 8.9	−0.5634	.5582	.1395	+13	−58
g Pleiadum	5½	+4.60	+21.4	+23 54.4	20 15.5	+ 6 50.0	+0.7667	.5595	+.1354	+90	+13
b Pleiadum	4	4.60	21.5	23 43.9	20 17.6	+ 6 52.0	+0.9570	.5595	.1353	+90	+25
m Pleiadum	7	4.60	21.4	24 27.4	20 24.1	+ 6 58.5	+0.2036	.5596	.1351	+56	−17
e Pleiadum	5	4.61	21.4	24 5.1	20 25.7	+ 7 0.0	+0.6001	.5597	.1349	+87	+ 4
c Pleiadum	5	4.61	21.4	23 59.3	20 41.7	+ 7 15.4	+0.7394	.5598	.1344	+90	+12
d Pleiadum	5	4.59	21.4	23 34.2	20 55.0	+ 7 28.2	+1.2114	.5600	.1337	+90	+46
η Tauri	3	+4.60	+21.2	+23 43.7	21 24.5	+ 7 56.6	+1.1079	.5603	+.1328	+90	+36
f Pleiadum	4	4.60	21.2	23 40.9	22 7.5	+ 8 38.1	+1.2523	.5609	.1309	+90	+51
h Pleiadum	5½	4.59	21.1	23 45.9	22 8.1	+ 8 38.7	+1.1655	.5609	.1309	+90	+41
B. A. C. 1192	6	4.64	20.8	25 12.7	22 35.2	+ 9 4.8	−0.3047	.5612	.1299	+27	−42
p Tauri	6	4.69	18.9	26 9.8	24 7 12.6	− 6 36.8	−0.2807	.5671	.1086	+28	−39
φ Tauri, *mult.*	5½	+4.69	+17.8	+27 3.6	11 8.3	− 2 49.9	−0.8171	.5696	+.0982	− 4	−63

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

OCTOBER.

Star's—					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle H	Y	x′	y′	N's.	S's.
		s	″	° ′	d	h m	h m				°	°
χ¹ Tauri	5½	+4.65	+17.9	+25 20.5	24	12 5.6	− 1 54.8	+1.0827	.5701	+.0959	+90	+38
χ² Tauri	8½	4.65	17.9	25 20.8		12 5.9	− 1 54.5	+1.0782	.5701	.0959	+90	+38
B. A. C. 1648	6½	4.66	11.5	27 50.0	25	11 36.3	− 3 18.4	−0.0498	.5811	.0293	+41	−19
β Tauri	2	4.66	10.8	28 30.3		13 41.3	− 1 18.3	−0.6950	.5817	.0230	+ 4	−60
B. A. C. 1746	6½	4.61	10.1	27 35.0		17 31.2	+ 2 22.5	+0.3305	.5827	+.0113	+65	+ 2
136 Tauri	5	+4.59	+ 8.3	+27 35.0	26	0 22.3	+ 8 57.4	+0.3373	.5837	−.0093	+65	+ 2
B. A. C. 1882	6½	4.61	7.5	28 55.4		1 36.6	+10 8.8	−1.0673	.5838	.0129	−23	−61
B. A. C. 2097	6½	4.47	4.0	28 17.5		14 54.4	− 1 5.1	−0.8521	.5835	.0533	− 6	−62
49 Aurigæ	5½	4.45	3.6	28 7.0		16 48.8	+ 0 44.8	−0.7786	.5833	.0593	− 1	−62
54 Aurigæ	6	4.43	3.0	28 22.2		18 31.3	+ 2 23.2	−1.1447	.5830	.0644	−31	−62
39 Geminor.	6½	+4.28	+ 1.7	+26 14.5	27	2 10.9	+ 9 44.6	+0.4730	.5813	−.0868	+76	+ 2
40 Geminor.	6½	4.26	1.7	26 4.8		2 26.6	+ 9 59.7	+0.6164	.5812	.0876	+90	+10
47 Geminor.	6	4.22	0.1	27 3.4		7 9.6	− 9 28.4	−0.8337	.5797	.1011	− 4	−63
52 Geminor.	6	4.14	+ 0 4	25 5.7		8 31.3	− 8 9.9	+1.0428	.5792	.1050	+90	+34
A Geminorum	5½	4.11	− 0.5	25 17.1		12 2.2	− 4 47.2	+0.4612	.5779	.1148	+74	− 1
B. A. C. 2514	6½	+4.01	− 2.0	+24 29.9		18 22.8	+ 1 18.7	+0.4852	.5752	−.1319	+76	− 1
κ Gemi., *mult.*	3½	3.98	2 6	24 41.4		20 30.3	+ 3 21.2	+0.0011	.5743	.1374	+44	−27
7 Cancri	6½	3.81	3.8	22 24.8	28	4 28.8	+11 1.5	+1.1489	.5703	.1579	+90	+37
μ¹ Cancri	6	3.81	4.2	22 59 0		5 28.8	+11 59.1	+0.4075	.5698	.1603	+70	− 8
η Cancri	6	3.58	5.9	20 51.3		16 31.6	− 1 22.8	+0.6609	.5639	.1862	+90	+ 2
35 Cancri	6½	+3.54	− 5.8	+20 0.5		17 38.8	− 0 18.1	+1.3131	.5633	−.1885	+90	+53
39 Cancri	6	3.53	6.5	20 26.3		19 39.6	+ 1 38.3	+0.4915	.5621	.1928	+76	− 8
40 Cancri	6	3.53	6.5	20 24.1		19 41.7	+ 1 40.3	+0.5214	.5621	.1928	+78	− 6
e Cancri	6	3.50	6.3	19 58.6		19 48.7	+ 1 47.1	+0.0324	.5621	.1930	+90	+17
42 Cancri	6½	3.51	6.4	20 9.1		19 55.6	+ 1 53.8	+0.7325	.5620	.1935	+82	+ 5
B. A. C. 2925	6½	+3.50	− 6.3	+20 0.8		20 1.1	+ 1 59.1	+0.8549	.5619	−.1937	+90	+12
γ Cancri	4½	3.55	7.2	21 54.5		20 59.2	+ 2 55.0	−1.2604	.5614	.1956	−38	−68
80 Cancri	6½	3.27	8.6	18 32.7	29	9 22.1	− 9 8.9	−0.4184	.5545	.2198	+22	−58
83 Cancri	6	3.23	9.1	18 13.4		12 27.2	− 6 10.4	−0.7775	.5529	.2251	+ 2	−67
7 Leonis	6½	3.05	9.3	14 55.4		19 57.2	+ 1 3.8	+0.8266	.5491	.2372	+90	+ 5
8 Leonis	6	+3.08	−10.1	+16 59.2		20 26.3	+ 1 31.9	−1.3737	.5488	−.2380	−52	−73
ψ Leonis	6	3.00	9.8	14 34.8		23 27.1	+ 4 26.4	+0.3342	.5473	.2423	+64	−22
ν Leonis	5	2.89	10.2	13 1.7	30	5 59.1	+10 44.8	+0.2884	.5445	.2512	+68	−25
α Leonis	1½	2.81	10.9	12 33.9		10 36.4	− 8 47.3	−0.4189	.5426	.2569	[illegible]	−63
URANUS				12 32.0		12 10.3	− 7 16.6	−0.7914	.5405	.2585	+ 3	−70
B. A. C. 3538	6½	+2.69	−10.9	+ 9 34.7		16 57.5	− 2 39.1	+0.9348	.5402	−.2637	+90	+ 8
44 Leonis	6	2.67	11.0	9 24.4		18 20.6	− 1 18.7	+0.7593	.5398	.2650	+90	− 2
B. A. C. 3562	6½	2.67	11.0	9 23.7		18 30.2	− 1 9.5	+0.7119	.5397	.2651	+90	− 5
45 Leonis	6	2.67	11.5	10 23.1		19 26.3	− 0 15.2	−0.5337	.5394	.2660	+16	−72
ρ Leonis	4	2.63	11.6	9 56.1		21 49.4	+ 2 3.1	0.7180	.5386	.2684	+ 7	−80
48 Leonis	6	+2.58	−11.1	+ 7 35.0		22 46.1	+ 2 57.9	+1.3944	.5384	−.2691	+90	+50
49 Leonis, *mult.*	6	2.61	11.6	9 16.9		22 51.7	+.3 3.4	−0.3392	.5383	.2691	+27	−61
37 Sextantis	6	2.52	11.5	7 1.0	31	3 59.8	+ 8 1.3	+0.5447	.5370	.2731	+77	−15
c Leonis	5	2.43	12.5	6 45.5		10 49.6	− 9 22.6	−1.0747	.5357	.2774	−15	−83
B. A. C. 3836	6	2.33	12.0	2 56.1		16 59.8	− 3 24.6	+1.0433	.5348	.2803	+90	+13
75 Leonis	5½	+2.31	−12.1	+ 2 41.0		18 35.0	− 1 52.5	+0.8521	.5347	−.2808	+90	+ 1
76 Leonis	6	2.30	12.1	2 19.3		19 21.3	− 1 7.7	+0.9982	.5347	.2811	+80	+10
79 Leonis	5½	2.27	12.2	2 4.7		21 45.2	+ 1 11.4	+0.5661	.5345	.2819	+79	−15
τ Leonis	5	+2.27	−12.8	+ 3 31.8		23 34.5	+ 2 57.2	−1.4035	.5244	−.2823	−48	−87

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle H	Y	x′	y′	N's.	S's.
υ Leonis	4½	+2.20	−12.3	− 0 8.9	1	3 49.0	+ 7 3.3	+1.0889	.5344	−.2831	+90	+16
χ Virginis	5	1.92	13.4	7 19.3	2	8 53.2	+11 10.1	+0.1298	.5390	.2748	+50	−37
B. A. C. 4259	6	1.93	13.2	7 21.5		8 56.9	+11 13.6	+0.1488	.5390	.2747	+31	−36
28 Virginis	6	1.92	13.4	6 49.6		10 8.1	−11 37.5	−0.7102	.5394	.2740	+ 6	−90
B. A. C. 4312	6½	+1.90	−13.3	− 9 40.4		14 27.4	− 7 26.9	+0.9734	.5408	−.2708	+81	+ 8

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

NOVEMBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
ψ Virginis	5	+1.90	-13.5	- 8 52.3	2 15 49.4	- 6 7.7	-0.2923	.5412	-.2696	+32	-56
σ Scorpii	3½	2.16	13.0	25 18.0	6 7 53.1	+ 6 44.6	-1.0042	.5768	.0076	-32	-90
α Scorpii	1½	2.20	13.8	26 9.7	11 10.7	+ 9 54.7	-0.4139	.5772	.0882	+ 1	-71
τ Scorpii	3½	2.24	13.0	27 57.7	13 44.8	-11 37.2	+1.2477	.5774	.0807	+62	+45
B. A. C. 5800	6½	2.41	11.4	26 50.3	7 5 13.1	+ 3 15.4	-0.8323	.5763	.0358	-27	-90
38 Ophiuchi	6½	+2.41	-11.1	-26 29.6	6 36.7	+ 4 35.7	-1.2428	.5761	-.0320	-58	-90
43 Ophiuchi	6	2.48	11.0	28 1.5	8 52.9	+ 6 46.7	+0.3048	.5756	-.0253	+23	-87
3 Sagittarii	5	2.59	9 8	27 47.1	18 44.2	- 7 44.6	-0.0574	.5725	+.0032	+12	-47
B. A. C. 6024	6½	2.59	9.5	27 1.3	19 54.1	- 6 37.3	-0.8610	.5721	.0063	-31	-90
B. A. C. 6063	6½	2.65	9.3	28 2.9	22 29.1	- 4 8.2	+0.2538	.5711	.0138	+29	-29
B. A. C. 6072	6½	+2.66	- 9.5	-28 44.5	23 15.9	- 3 23.2	+1.0065	.5707	+.0160	+61	+18
B. A. C. 6120	6½	2.70	9.0	28 22.3	8 2 38.0	- 0 8.6	+0 6815	.5691	.0255	+58	- 5
B. A. C. 6127	5	2.71	8.9	28 28.3	3 10.2	+ 0 28.4	+0.8017	.4689	.0269	+63	+ 3
B. A. C. 6190	6½	2.77	8.5	28 41.5	7 2.2	+ 4 5.7	+1.1636	.4669	.0376	+62	+34
B. A. C. 6191	6½	2.76	8.4	28 19.6	7 2.5	+ 4 5.9	+0.7736	.4669	.0376	+62	+ 1
B. A. C. 6194	6	+2.74	- 7.9	-27 5.3	7 21.2	+ 4 24.0	-0.5374	.5667	+.0385	-10	-82
B A. C. 6220	6½	2.80	8.1	28 29.3	8 58.1	+ 5 57.2	+1.0252	.5659	.0428	+62	+29
φ Sagittarii	3½	2.88	6.2	27 7.0	19 0.8	- 8 22.1	+0.1220	.5597	.0692	+27	-37
σ Sagittarii	2½	2.92	5.4	26 26.9	23 9.9	- 4 22.0	-0.2870	.5570	.0798	+ 7	-62
B. A. C. 6562	6½	3.02	3.9	26 6.8	9 7 0.7	+ 3 12.1	+0.0522	.5514	.0986	+26	-41
ψ Sagittarii	6	+3.00	- 3.5	-25 28.1	8 2.8	+ 4 12.1	-0.5421	.5506	+.1012	- 4	-81
χ¹ Sagittarii	6	3.04	2.6	24 44.8	12 23.5	+ 8 23.7	-0.8624	.5474	.1111	-21	-90
χ² Sagittarii	6½	3.04	2.6	24 39.2	12 26.5	+ 8 26.5	-0.9581	.5473	.1113	-27	-90
h¹ Sagittarii	6	3.09	1.9	24 59.2	17 13.8	-10 56.0	-0.0389	.5435	.1219	+24	-46
h² Sagittarii	4½	3.11	1.9	25 9.2	17 31.8	-10 38.7	+0.1784	.5433	.1226	+35	+34
53 Sagittarii	6	+3.09	- 1.2	-23 42.3	18 59.3	- 9 14.2	-1.2142	.5423	+.1255	-46	-90
B. A. C. 6727	6½	3.09	- 1.2	23 42.4	19 7.2	- 9 6.6	-1.1948	.5422	.1250	-44	-90
B. A. C. 6864	6	3.19	+ 0.9	23 4.4	10 4 58.0	+ 0 24.6	-0.5489	.5345	.1455	+ 1	-81
B. A. C. 6878	6½	3.19	1.1	22 56.3	6 4.2	+ 1 28.5	-0.5339	.5336	.1480	+ 2	-79
4 Capricorni	6	3.24	2.3	22 11.3	12 52.0	+ 8 3.2	-0.3056	.5283	.1606	+15	-62
B. A. C. 7049	6	+3.32	+ 3.0	-22 48.8	18 24.9	-10 34.6	+1.2797	.5240	+.1702	+67	+42
19 Capricorni	6	3.33	6.6	18 23.2	11 7 2.7	+ 1 39.7	-1.2859	.5149	.1897	-45	-90
20 Capricorni	6	3.38	6.8	19 30.5	9 27.1	+ 3 59.7	+0.4095	.5132	.1931	+56	-22
21 Capricorni	6	3.35	7.3	18 0.4	10 7.4	+ 4 38.8	-1.1128	.5127	.1943	-28	-90
θ Capricorni	4	3.36	7.9	17 43.1	12 42.9	+ 7 9.6	-0.9236	.5110	.1977	-14	-90
30 Capricorni	6	+3.45	+ 8.7	-18 29.7	18 54.3	-10 49.9	+1.1820	.5070	+.2056	+72	+26
31 Capricorni	6½	3.44	8.8	17 58.4	19 4.4	-10 40.1	+0.6408	.5069	.2058	+71	-10
ι Capricorni	4½	3.44	9.5	17 21.3	21 9.8	- 8 38.4	+0.3913	.5056	.2085	+58	-23
42 Capricorni	5	3.48	12.0	14 35.5	12 7 26.0	+ 1 20.1	-0.4578	.4998	.2199	+15	-72
44 Capricorni	6	3.49	11.9	14 57.5	8 14.2	+ 2 6.9	+0.1237	.4994	.2208	+45	-37
45 Capricorni	6	+3.50	+11.9	-15 18.6	8 44.4	+ 2 36.2	+0.6246	.4991	+.2213	+73	-11
μ Capricorni	5	3.53	13.1	14 7.6	13 44.1	+ 7 27.5	+0.4333	.4967	.2260	+63	-21
B. A. C. 7607	6½	3.52	15.2	11 2.5	21 26.9	- 9 2.7	-1.2081	.4932	.2326	-29	-90
c¹ Aquarii	6	3.55	15.4	11 25.2	23 12.7	- 7 19.8	-0.3773	.4925	.2342	+21	-65
c² Aquarii	5½	3.55	15.2	12 9.9	23 15.3	- 7 17.3	+0.4569	.4925	.2343	+66	-20
67 Aquarii	6	+3.62	+19.0	- 7 36.0	13 17 29.2	+10 26.8	-0.2042	.4872	+.2464	+32	-55
B. A. C. 7966	6	3.65	20.4	5 38.9	14 0 14.8	- 6 58.4	-0.6974	.4862	.2497	+ 7	-90
B. A. C. 8094	6	3.70	22.5	4 9.5	11 49.0	+ 4 17.3	+0.5842	.4853	.2539	+79	- 4
11 Piscium	4½	3.76	23.5	2 27.7	19 42.2	+11 57.8	+0.7238	.4855	.2558	+86	- 7
14 Piscium	6	3.78	23.6	- 1 55.2	22 21.7	- 9 26.0	+0.8085	.4858	.2563	+71	- 2
λ Piscium	5	3.78	24.9	+ 1 6.6	15 2 51.6	- 5 4.2	-1.3726	.4863	.2568	-42	-89
B. A. C. 8276	6½	+3.82	+25.2	+ 1 32.4	6 40.4	- 1 21.6	-0.8646	.4870	+.2571	- 1	-89
21 Piscium	6	3.82	25.0	0 24.0	7 2.0	- 1 0.5	+0.4808	.4870	.2571	+72	-19
22 Piscium	6	3.82	25.7	2 15.2	8 26.8	+ 0 22.0	-1.1921	.4873	.2571	-23	-88
25 Piscium	6	3.82	25.5	1 24.9	9 4.4	+ 0 58.6	-0.1089	.4874	.2572	+38	-50
51 Pisc., *mult.*	6	3.99	27.8	6 17.1	16 6 55.4	- 1 46.0	+0.1494	.4947	.2535	+52	-35
η Piscium	3½	+4.30	+29.6	+14 43.2	17 14 8.8	+ 4 33.0	-1.3338	.5132	+.2343	-41	-76

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

NOVEMBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
101 Piscium	6	+4.31	+29.3	+14 2.4	17 16 19.4	+ 6 40.2	−0.0906	.5148	+.2323	+39	−44
104 Piscium	6½	4.34	29.2	15 40.2	18 4.9	+ 8 22.6	+0.7140	.5161	.2306	+90	− 2
4 Arietis	6	4.42	29.4	16 21.1	22 31.3	−11 19.2	−1.1543	.5196	.2260	−23	−74
ι Arietis	6	4.44	29.3	17 13.5	18 3 2.3	− 6 56.6	−1.0794	.5232	.2218	−18	−73
B. A. C. 632	6	4.48	29.2	17 40.2	6 8.4	− 3 56.2	−0.8758	.5257	.2170	− 4	−73
θ Arietis	5½	+4.58	+28.7	+19 20.4	13 2.5	+ 2 44.6	−1.1912	.5316	+.2077	−28	−71
26 Arietis	6	4.64	28.1	19 19.0	18 55.5	+ 8 26.2	+0.0313	.5368	.1988	+46	−32
B. A. C. 782	6½	4.63	27.9	18 20.7	20 19.3	+ 9 47.2	+1.3406	.5380	.1967	+90	+56
μ Arietis	5½	4.70	27.4	19 29.6	19 0 20.8	−10 19.3	+0.8964	.5415	.1900	+90	+15
ε Arietis, *mult.*	4½	4.81	26.5	20 51.3	7 57.0	− 2 58.7	+0.8455	.5484	.1765	+90	+13
64 Arietis	6	+4.99	+24.8	+24 17.6	18 54.4	+ 7 31.8	−0.9712	.5580	+.1543	−13	−66
66 Arietis	6½	4.95	24.5	22 23.1	20 43.4	+ 9 16.9	+1.3131	.5596	.1502	+90	+60
7 Tauri, *mult.*	6	5.02	24.0	24 3.4	23 15.4	+11 47.3	−0.0710	.5619	.1445	+40	−31
11 Tauri	6	5.06	23.4	24 56.2	20 1 55.5	− 9 38.4	−0.6177	.5641	.1382	+ 9	−62
g Pleiadum	5½	5.04	23.1	23 54.4	3 38.7	− 7 59.1	+0.6971	.5655	.1342	+90	+ 9
b Pleiadum	4	+5.04	+23.0	+23 43.9	3 40.7	− 7 57.2	+0.8861	.5655	+.1342	+90	+20
m Pleiadum	7	5.07	23.0	24 27.4	3 47.1	− 7 50.9	−0.1387	.5656	.1340	+36	−34
e Pleiadum	5	5.06	23.0	24 5.2	3 48.6	− 7 49.5	+0.5320	.5656	.1339	+90	0
c Pleiadum	5	5.05	22.9	23 59.3	4 4.4	− 7 34.3	+0.6694	.5659	.1333	+90	+ 8
d Pleiadum	5	5.04	23.0	23 34.2	4 17.5	− 7 21.6	+1.1371	.5660	.1328	+90	+39
η Tauri	3	+5.05	+22.8	+24 43.8	4 46.4	− 6 53.9	+1.0335	.5664	+.1316	+90	+31
f Pleiadum	4	5.05	22.7	23 40.9	5 28.7	− 6 13.1	+1.1746	.5670	.1299	+90	+43
h Pleiadum	5½	5.05	22.7	23 45.9	5 29.2	− 6 12.7	+1.0882	.5670	.1299	+90	+35
B. A. C. 1192	6	5.09	22.5	25 12.7	5 55.8	− 5 47.0	−0.3707	.5674	.1287	+23	−46
p Tauri	6	5.21	20.6	26 9.9	14 23.2	+ 2 21.4	−0.3664	.5738	.1074	+23	−44
φ Tauri, *mult.*	5½	+5.25	+19.5	+27 3.6	18 14.4	+ 6 3.7	−0.9072	.5765	+.0970	−10	−53
*χ*¹ Tauri	5½	5.20	19.4	25 20.6	19 10.6	+ 6 57.8	+0.9734	.5771	.0946	+90	+30
*χ*² Tauri	8½	5.20	19.4	25 20.8	19 10.8	+ 6 58.0	+0.9694	.5771	.0946	+90	+30
B. A. C. 1648	6½	5.36	12.4	27 50.0	21 18 12.4	+ 5 5.2	−0.1981	.5886	.0275	+32	−27
β Tauri	2	5.40	11.8	28 30.3	20 14.7	+ 7 2.6	−0.8416	.5892	.0211	− 6	−62
B. A. C. 1746	6½	+5.35	+10.8	+27 35.0	23 59.9	+10 38.7	+0.1668	.5901	+.0097	+54	− 6
136 Tauri	5	5.35	8.6	27 35.0	22 6 42.8	− 6 54.7	+0.1605	.5911	−.0113	+54	− 7
B. A. C. 1882	6½	5.40	7.9	28 55.4	7 55.6	− 5 44.8	−1.2348	.5912	.0153	−45	−61
B. A. C. 2097	6½	5.32	3.6	28 17.5	20 58.4	+ 6 46.2	−1.0457	.5904	.0558	−21	−62
49 Aurigæ	5½	5.30	3.1	28 7.0	22 50.7	+ 8 34.1	−0.9763	.5900	.0616	−15	−62
37 Geminor.	6	+5.13	+ 1.0	+25 31.7	23 6 42.6	− 7 53.1	+1.0975	.5878	−.0851	+90	+41
39 Geminor.	6½	5.15	0.2	26 14.5	8 3.5	− 6 35.4	+0.2497	.5873	.0893	+59	− 9
40 Geminor.	6½	5.13	+ 0.2	26 4.8	8 19.0	− 6 20.6	+0.3921	.5872	.0901	+69	− 2
47 Geminor.	6	5.13	− 1.5	27 3.4	12 57.6	− 1 53.0	−1.0563	.5854	.1035	−21	−63
52 Geminor.	6	5.05	1.6	25 5.7	14 18.3	− 0 35.6	+0.8061	.5848	.1072	+90	+19
A Geminorum	5½	+5.02	− 2.6	+25 17.1	17 46.3	+ 2 44.2	+0.2228	.5831	−.1172	+57	−13
B. A. C. 2514	6½	4.94	4.6	24 29.8	24 0 2.3	+ 8 45.5	+0.2373	.5799	.1344	+58	−14
κ Gemi., *mult.*	3½	4.92	5.0	24 41.4	2 8.5	+10 46.8	−0.2471	.5787	.1400	+30	−40
7 Cancri	6½	4.72	6.7	22 24.8	10 2.4	− 5 37.6	+0.8859	.5739	.1600	+90	+18
*μ*¹ Cancri	6	4.73	7.2	22 59.0	11 2.0	− 4 40.2	+0.1456	.5733	.1624	+59	−22
*μ*² Cancri	5½	+4.68	− 7.1	+21 56.1	11 39.1	− 4 4.5	+1.1110	.5729	−.1638	+90	+33
B. A. C. 2788	6	4.58	8.2	21 8.0	16 51.2	+ 0 55.7	+1.0421	.5694	.1761	+90	+27
η Cancri	6	4.52	9.6	21 51.3	22 0.9	+ 5 53.8	+0.3859	.5659	.1876	+68	−12
35 Cancri	6½	4.46	9.5	20 0.5	23 7.7	+ 6 58.2	+1.0363	.5652	.1900	+90	+25
39 Cancri	6	4.45	10.2	20 26.2	25 1 8.3	+ 8 54.3	+0.2139	.5638	.1939	+56	−22
40 Cancri	6	4.45	10.2	20 24.1	1 10.4	+ 8 56.3	+0.2435	.5638	.1939	+58	−20
ε Cancri	6	+4.44	−10.1	+19 58.5	1 17.4	+ 9 3.1	+0.6537	.5637	−.1943	+90	+ 1
42 Cancri	6½	4.45	10.2	20 9.0	1 24.2	+ 9 9.7	+0.4543	.5637	.1945	+72	−10
B. A. C. 2925	6½	4.45	10.1	20 0.7	1 30.8	+ 9 16.0	+0.5768	.5636	.1947	+83	− 4
80 Cancri	6½	4.21	13.1	18 32.6	14 50.8	− 1 52.9	−0.7071	.5546	.2201	+ 6	−72
83 Cancri	6	4.16	13.7	18 13.3	17 56.4	+ 1 6.1	−1.0691	.5525	.2251	−17	−72
7 Leonis	6½	+3.97	−14.2	+14 55.4	26 1 28.8	+ 8 22.8	+0.5348	.5477	−.2368	+78	−11

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

NOVEMBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
ψ Leonis	6	+3.92	−14.7	+14 34.7	26 5 0.2	+11 46.9	+0.0403	.5456	−.2417	+46	−36
ν Leonis	5	3.78	15.5	13 1.6	11 35.8	− 5 51.1	−0.0067	.5419	.2499	+44	−40
A Leonis	5	3.67	15.4	10 35.7	16 4.0	− 1 31.8	+1.3283	.5395	.2549	+90	+42
α Leonis	1½	3.71	16.1	12 33.8	16 16.3	− 1 20.0	−0.7178	.5394	.2551	+ 6	−77
Uranus				12 22.1	18 47.5	+ 1 6.1	−1.1671	.5382	.2575	−23	−78
B. A. C. 3538	6½	+3.56	−16.1	+ 9 34.6	22 42.5	+ 4 53.3	+0.6455	.5364	−.2613	+86	− 8
44 Leonis	6	3.54	16.3	9 24.3	27 0 6.8	+ 6 14.9	+0.4524	.5358	.2626	+71	−18
B. A. C. 3562	6½	3.54	16.3	9 23.6	0 16.6	+ 6 24.3	+0.4214	.5357	.2627	+69	−20
45 Leonis	6	3.54	16.9	10 23.0	1 13.5	+ 7 19.3	−0.8325	.5353	.2635	0	−80
ρ Leonis	4	3.50	17.0	9 56.0	3 38.8	+ 9 39.8	−1.0172	.5343	.2655	−11	−80
48 Leonis	6	+3.45	−16.4	+ 7 34.9	4 36.4	+10 35.6	+1.1117	.5340	−.2662	+90	+19
49 Leonis	6	3.48	17.0	9 16.8	4 42.1	+10 41.1	−0.6350	.5340	.2663	+11	−79
37 Sextantis	6	3.37	16.9	7 1.0	9 55.7	− 8 15.5	+0.2587	.5322	.2698	+58	−29
d Leonis	5	3.26	16.8	4 16.4	16 48.6	− 1 36.1	+1.1687	.5303	.2735	+90	+22
c Leonis	5	3.29	17.7	6 45.4	16 53.2	− 1 31.6	−1.3699	.5302	.2736	−42	−83
B. A. C. 3636	6	+3.16	−17.2	+ 2 56.1	23 11.1	+ 4 34.2	+0.7739	.5290	−.2759	+90	− 3
75 Leonis	5½	3.13	17.5	2 40.9	28 0 48.4	+ 8 8.4	+0.5820	.5287	.2764	+80	−14
76 Leonis	6	3.12	17.3	2 19.2	1 35.8	+ 6 54.2	+0.7316	.5286	.2766	+90	− 6
79 Leonis	5½	3.09	17.4	+ 2 4.7	4 2.9	+ 9 16.6	+0.2981	.5282	.2772	+60	−28
υ Leonis	4½	2.99	17.2	− 0 9.0	10 15.2	− 8 43.0	+0.8354	.5277	.2779	+90	0
χ Virginis	5	+2.65	−17.2	− 7 19.4	29 16 4.9	− 3 50.6	−0.0800	.5314	−.2688	+38	−48
B. A. C. 4259	6	2.65	17.2	7 21.6	16 8.7	− 3 47.0	−0.0605	.5314	.2688	+30	−47
28 Virginis	6	2.66	17.4	6 49.7	17 21.8	− 2 36.2	−0.9279	.5317	.2680	− 7	−90
B. A. C. 4312	6½	2.59	16.8	9 40.4	21 48.0	+ 1 41.3	+0.7869	.5331	.2647	+73	− 3
ψ Virginis	5	2.59	17.2	8 52.5	23 12.3	+ 3 2.8	−0.3967	.5336	.2635	+21	−67
g Virginis	6	+2.54	−17.1	−10 5.2	30 5 32.3	+ 9 10.4	−0.8143	.5360	−.2579	− 2	−90
ι Virginis	6	2.48	16.8	12 4.3	14 14.9	− 6 24.4	−0.9959	.5397	.2488	−14	−90
75 Virginis	6	2.45	16.2	14 44.1	17 2.4	− 3 42.5	+1.0361	.5411	.2450	+75	+14
B. A. C. 4531	6	2.45	16.8	12 35.3	17 53.5	− 2 53.1	−0.8545	.5415	.2439	− 6	−90
83 Virginis	6	2.42	16.2	15 33.9	22 19.5	+ 1 24.0	+0.6091	.5438	.2381	+72	−12
85 Virginis	6	+2.43	−16.3	−15 9.2	22 49.5	+ 1 52.9	+0.0699	.5441	−.2374	+41	−41

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
B. A. C. 4722	6	+2.37	−15.7	−17 37.8	1 12 7.9	− 9 16.2	−0.4149	.5512	−.2164	+15	−70
B. A. C. 4739	6½	2.36	15.6	18 8.9	13 32.9	− 7 54.1	−0.1883	.5520	.2140	+26	−55
B. A. C. 4923	6	2.34	15.0	20 51.7	2 6 15.3	+ 8 12.6	−0.7086	.5613	−.1813	− 5	−90
φ Sagittarii	3½	+2.78	− 5.3	−27 7.0	6 4 4.6	+ 2 29.6	+0.3059	.5633	+.0718	+37	−86
σ Sagittarii	2½	2.81	4.5	26 26.9	8 12.0	+ 6 28.0	−0.0943	.5607	.0821	+17	−49
B. A. C. 6562	6½	2.86	3.2	26 6.8	15 59.3	−10 1.4	+0.2604	.5553	.1012	+37	−20
ψ Sagittarii	6	2.85	2.9	25 28.0	17 0.9	− 9 2.0	−0.3307	.5545	.1038	+ 7	−64
χ¹ Sagittarii	6	2.87	2.0	24 44.8	21 19.6	− 4 52.4	−0.6411	.5514	.1138	− 8	−90
χ² Sagittarii	6½	+2.87	− 2.1	−24 39.2	21 21.5	− 4 50.6	−0.7359	.5514	+.1138	−13	−90
χ³ Sagittarii	6	2.85	2.0	24 12.1	21 26.5	− 4 45.8	−1.2165	.5513	.1140	−66	−90
h¹ Sagittarii	6	2.91	1.4	24 59.2	7 2 7.4	− 0 14.6	+0.1900	.5477	.1245	+36	−33
h² Sagittarii	4½	2.91	1.4	25 9.2	2 25.2	+ 0 2.5	+0.4075	.5475	.1251	+48	−21
53 Sagittarii	6	2.90	0.9	23 42.3	3 52.0	+ 1 26.4	−0.9788	.5464	.1281	−27	−90
B. A. C. 6727	6½	+2.90	− 0.8	−23 42.4	3 59.9	+ 1 34.0	−0.9592	.5463	+.1284	−25	−90
B. A. C. 6864	6	2.96	+ 0.8	23 4.4	13 45.6	+11 0.0	−0.2963	.5385	.1485	+14	−62
B. A. C. 6878	6½	2.95	1.1	22 56.3	14 51.2	−11 56.6	−0.2794	.5376	.1506	+15	−61
4 Capricorni	6	2.99	2.4	22 11.3	21 35.5	− 5 25.5	−0.0400	.5321	.1630	+28	−46
Venus				21 33.3	8 6 19.3	+ 3 1.6	+0.7628	.4816	.1651	+65	− 2
B. A. C. 7202	6	+3.03	+ 6.1	−18 38.9	12 26.0	+ 8 56.8	−1.3065	.5205	+.1873	−60	−90
19 Capricorni	6	3.05	6.2	18 23.3	15 37.6	−11 57.5	−0.9897	.5180	.1919	−19	−90
20 Capricorni	6	3.10	6.2	19 30.5	18 1.0	− 9 38.5	+0.7049	.5162	.1954	+71	− 7
21 Capricorni	6	3.07	6.7	18 0.4	18 41.0	− 8 59.7	−0.8132	.5157	.1962	− 8	−90
θ Capricorni	4	+3.08	+ 7.3	−17 43.1	21 15.6	− 6 29.9	−0.6210	.5138	+.1907	+ 4	−86

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

DECEMBER.

Star's—					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	"	° ′	d	h m	h m				°	°
31 Capricorni	6½	+3.12	+ 8.1	-17 58.4	9	3 34.7	- 0 22.0	+0.9475	.5093	+.2076	+72	+ 9
ι Capricorni	4½	3.14	8.7	17 21.3		5 39.4	+ 1 39.1	+0.7015	.5080	.2101	+73	- 6
42 Capricorni	5	3.16	10.9	14 35.5		15 52.9	+11 34.8	-0.1257	.5016	.2212	+32	-51
44 Capricorni	6	3.21	10.7	14 57.5		16 40.9	-11 38.6	+0.4459	.5010	.2220	+63	-20
45 Capricorni	6	3.19	10.7	15 18.7		17 11.0	-11 9.4	+0.9465	.5008	.2225	+75	+ 8
μ Capricorni	5	+3.22	+11.9	-14 7.6		22 9.7	- 6 19.1	+0.7591	.4980	+.2270	+74	- 4
B. A. C. 7697	6½	3.20	13.8	11 2.5	10	5 51.7	+ 1 10.0	-0.8752	.4942	.2334	- 6	-90
e¹ Aquarii	6	3.23	13.9	11 26.3		7 37.3	+ 2 52.7	-0.0442	.4933	.2348	+38	-46
e² Aquarii	5½	3.23	13.6	12 9.9		7 40.0	+ 2 55.3	+0.7894	.4933	.2348	+71	- 2
B. A. C. 7774	6	3.23	14.9	9 38.9		11 9.2	+ 6 18.8	-1.1706	.4918	.2374	-25	-90
67 Aquarii	6	+3.31	+17.4	- 7 36.1	11	1 54.8	- 3 19.7	+0.1343	.4867	+.2459	+50	-37
B. A. C. 7986	6	3.34	18.7	5 38.2		8 41.7	+ 3 16.3	-0.3599	.4851	.2489	+25	-64
B. A. C. 8094	6	3.41	20.4	4 9.5		20 19.3	- 9 24.6	+0.9213	.4836	.2526	+86	+ 5
11 Piscium	6½	3.47	21.9	2 27.7	12	4 15.6	- 1 40.9	+1.0568	.4834	.2541	+88	+14
14 Piscium	6	3.49	22.0	- 1 55.2		6 56.3	+ 0 56.6	+1.1395	.4835	.2544	+88	+19
λ Piscium	5	+3.51	+23.3	+ 1 6.6		11 28.2	+ 5 20.3	-1.0512	.4838	+.2547	-13	-89
B. A. C. 8276	6½	3.54	23.8	1 32.4		15 19.0	+ 9 5.0	-0.5454	.4843	.2547	+16	-77
21 Piscium	6	3.56	23.4	0 24.0		15 40.8	+ 9 26.2	+0.8037	.4844	.2547	+90	- 2
22 Piscium	6	3.55	24.2	2 15.2		17 6.3	+10 49.5	-0.8758	.4846	.2547	- 2	-88
25 Piscium	6	3.58	24.0	1 24.8		17 44.2	+11 26.4	+0.2099	.4847	.2547	+55	-33
45 Piscium	6	+3.74	+25.1	+ 7 1.1	13	12 5.0	+ 5 17.5	-1.2966	.4897	+.2515	-33	-88
51 Pisc., *mult.*	6	3.79	26.7	6 17.1		15 48.0	+ 8 54.4	+0.4406	.4911	.2503	+70	-20
η Piscium	3½	4.17	29.3	14 43.2	14	23 19.4	- 8 27.9	-1.1064	.5098	.2309	-19	-76
101 Piscium	6	4.19	29.1	14 2.4	15	1 31.8	- 6 19.4	+0.1353	.5114	.2288	+51	-32
104 Piscium	6½	4.23	28.8	13 40.2		3 18.1	- 4 36.2	+0.9386	.5127	.2272	+90	+11
105 Piscium	6	+4.23	+29.5	+15 47.3		3 29.6	- 4 25.1	-1.3044	.5128	+.2270	-39	-74
4 Arietis	6	4.32	29.4	16 21.1		7 46.7	- 0 15.8	-0.9451	.5163	.2225	- 8	-74
ι Arietis	6	4.38	29.5	17 13.5		12 19.6	+ 4 8.8	-0.8808	.5202	.2174	- 4	-73
B. A. C. 632	6	4.42	29.4	17 40.2		15 27.0	+ 7 10.4	-0.6837	.5228	.2137	+ 7	-72
15 Arietis	6	4.49	29.4	18 55.6		18 47.2	+10 24.2	-1.3231	.5257	.2095	-44	-71
θ Arietis	5½	+4.55	+29.1	+19 20.4		22 23.5	-10 6.4	-1.0160	.5290	+.2047	-14	-71
26 Arietis	6	4.62	28.5	19 19.0	16	4 18.1	- 4 23.3	+0.1941	.5345	.1960	+55	-24
ν Arietis	5½	4.73	28.7	21 26.2		8 4.5	- 0 44.3	-1.3323	.5382	.1900	-51	-69
μ Arietis	5½	4.72	28.0	19 29.6		9 44.4	+ 0 52.2	+1.0454	.5399	.1871	+90	+25
ε Arietis, *mult.*	4½	4.86	27.1	20 51.3		17 21.3	+ 8 13.6	+0.9739	.5472	.1738	+90	+22
64 Arietis	6	+5.11	+25.9	+24 17.6	17	4 18.1	- 5 12.6	-0.8678	.5521	+.1518	- 6	-65
7 Tauri, *mult.*	6	5.18	25.1	24 3.4		8 38.3	- 1 1.7	+0.0192	.5621	.1421	+45	-26
11 Tauri	6	5.23	24.6	24 56.2		11 17.7	+ 1 31.8	-0.5326	.5646	.1361	+14	-56
g Pleiadum	5½	5.23	24.1	23 54.4		13 0.4	+ 3 10.7	+0.7737	.5662	.1321	+90	+14
b Pleiadum	4	5.22	24.1	23 43.9		13 2.4	+ 3 12.6	+0.9618	.5663	.1318	+90	+25
m Pleiadum	7	+5.25	+24.2	+24 27.5		13 8.6	+ 3 18.6	+0.2158	.5664	+.1316	+57	-15
e Pleiadum	5	5.24	24.1	24 5.2		13 10.3	+ 3 20.2	+0.6083	.5664	.1315	+88	+ 5
c Pleiadum	5	5.24	24.0	23 59.3		13 25.9	+ 3 35.3	+0.7446	.5666	.1309	+90	+13
d Pleiadum	5	5.23	23.9	23 34.2		13 39.0	+ 3 47.9	+1.2103	.5668	.1304	+90	+46
η Tauri	3	5.24	23.7	23 43.8		14 7.7	+ 4 15.5	+1.1054	.5673	.1292	+90	+36
f Pleiadum	4	+5.24	+23.7	+23 40.9		14 49.7	+ 4 56.0	+1.2448	.5679	+.1276	+90	+51
h Pleiadum	5½	5.24	23.7	23 45.9		14 50.2	+ 4 56.4	+1.1585	.5679	.1276	+90	+41
B. A. C. 1192	6	5.31	23.8	25 12.7		15 16.7	+ 5 22.0	-0.2965	.5683	.1266	+27	-41
p Tauri	6	5.45	21.8	26 9.9		23 40.6	-10 33.2	-0.3139	.5756	.1052	+26	-40
φ Tauri, *mult.*	5½	5.52	20.9	27 3.6	18	3 29.6	- 6 53.2	-0.8610	.5787	.0961	- 6	-63
χ¹ Tauri	5½	5.48	20.4	25 20.6		4 25.2	- 5 59.6	+1.0072	.5795	.0923	+90	+33
χ² Tauri	8½	+5.48	+20.4	+25 20.8		4 25.5	- 5 59.3	+1.0032	.5795	+.0923	+90	+33
B. A. C. 1648	6½	5.81	13.6	27 50.0	19	3 8.4	- 8 10.8	-0 2152	.5938	.0251	+31	-28
β Tauri	2	5.87	13.0	28 30.3		5 8.7	- 6 15.4	-0.8580	.5946	.0187	- 7	-62
B. A. C. 1746	6½	5.86	11.3	27 35.0		8 49.8	- 2 43.4	+0.1326	.5959	+.0070	+52	- 8
136 Tauri	5	5.90	9.0	27 35.0		15 24.8	+ 3 35.2	+0.1098	.5976	-.0142	+50	-10
B. A. C. 2097	6½	+5.96	+ 3.7	+28 17.5	20	5 21.7	- 7 2.6	-1.1169	.5980	-.0590	-28	-62

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

DECEMBER.

Star's—					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
49 Aurigæ	5½	+5.96	+ 3.0	+28 7.0	20 7 11.4	− 5 17.5	−1.0627	.5978	−.0646	−22	−62
37 Geminor.	6	5.82	+ 0.2	25 31.6	14 51.8	+ 2 4.0	+0.9781	.5961	.0889	+90	+32
39 Geminor.	6½	5.86	− 0.2	26 14.5	16 10.6	+ 3 19.5	+0.1380	.5957	.0929	+52	−16
40 Geminor.	6½	5.84	0.4	26 4.7	16 25.7	+ 3 33.9	+0.2780	.5956	.0938	+61	− 9
47 Geminor.	6	5.88	2.1	27 3.4	20 57.2	+ 7 54.2	−1.1628	.5940	.1074	−32	−63
52 Geminor.	6	+5.78	− 2.5	+25 5.7	22 15.7	+ 9 9.6	+0.6728	.5935	−.1114	+90	+10
A Geminor.	5½	5.77	3.9	25 17.0	21 1 38.3	−11 36.1	+0.0893	.5920	.1212	+49	−20
B. A. C. 2514	6½	5.71	6.0	24 29.8	7 44.1	− 5 45.1	+0.0897	.5888	.1386	+49	−22
κ Gemi., *mult.*	3½	5.71	6.9	24 41.3	9 46.8	− 3 47.2	−0.3930	.5878	.1441	+22	−48
84 Geminor.	6½	5.58	7.9	22 39.0	13 10.9	− 0 31.3	+1.1516	.5856	.1533	+90	+38
7 Cancri	6½	+5.54	− 9.1	+22 24.7	17 27.9	+ 3 35.5	+0.7081	.5829	−.1645	+90	+ 7
μ¹ Cancri	6	5.56	9.6	22 58.9	18 25.8	+ 4 31.2	−0.0245	.5823	.1670	+42	−30
μ² Cancri	5½	5.50	9.5	21 56.1	19 1.9	+ 5 5.9	+0.9266	.5819	.1685	+90	+39
B. A. C. 2788	6	5.43	11.1	21 7.9	22 0 5.5	+ 9 57.7	+0.8480	.5785	.1807	+90	+14
η Cancri	6	5.37	12.7	20 51.2	5 6.8	− 9 12.6	+0.1906	.5748	.1926	+55	−22
35 Cancri	6½	+5.32	−12.9	+20 0.4	6 11.8	− 8 10.0	+0.8305	.5740	−.1946	+90	+11
39 Cancri	6	5.32	13.6	20 26.2	8 9.1	− 6 17.2	+0.0148	.5725	.1989	+45	−31
40 Cancri	6	5.31	13.6	20 24.0	8 11.2	− 6 15.2	+0.0440	.5725	.1989	+46	−31
ε Cancri	6	5.29	13.5	19 58.5	8 17.0	− 6 9.7	+0.4486	.5725	.1991	+72	−10
42 Cancri	6½	5.30	13.5	20 8.9	8 24.6	− 6 2.3	+0.2615	.5724	.1993	+58	−19
B. A. C. 2925	6½	+5.30	−13.5	+20 0.6	8 30.1	− 5 57.1	+0.3720	.5723	−.1995	+66	−14
80 Cancri	6½	5.10	17.0	18 32.6	21 30.2	+ 6 34.0	−0.9200	.5627	.2247	− 7	−72
83 Cancri	6	5.05	17.8	18 13.2	23 0 31.1	+ 9 28.3	−1.2826	.5602	.2299	−37	−72
7 Leonis	6½	4.83	18.7	14 55.3	7 52.6	− 7 26.0	+0.2901	.5550	.2412	+60	−23
ψ Leonis	6	4.81	19.6	14 34.7	11 19.3	− 4 6.6	−0.2041	.5525	.2460	+33	−49
ν Leonis	5	+4.63	−20.5	+13 1.5	17 46.4	+ 2 7.0	−0.2594	.5483	−.2539	+30	−54
A Leonis	5	4.58	20.6	10 35.6	22 9.1	+ 6 20.6	+1.0578	.5455	.2586	+90	+17
α Leonis	1½	4.62	21.2	12 33.7	22 21.1	+ 6 32.3	−0.9692	.5454	.2588	− 9	−78
B. A. C. 3538	6½	4.50	21.7	9 34.5	24 4 40.2	−11 21.5	+0.3745	.5417	.2647	+66	−22
44 Leonis	6	4.47	21.8	9 24.2	6 3.0	−10 1.5	+0.1820	.5410	.2659	+54	−32
B. A. C. 3562	6½	+4.47	−21.8	+ 9 23.5	6 12.6	− 9 52.2	+0.1513	.5410	−.2660	+52	−34
45 Leonis	6	4.47	22.2	10 22.9	7 8.6	− 8 58.1	−1.0927	.5404	.2667	−17	−80
ρ Leonis	4	4.42	22.5	9 55.9	9 31.5	− 6 40.0	−1.2791	.5392	.2685	−32	−80
48 Leonis	6	4.36	21.9	7 34.8	10 28.2	− 5 45.2	+0.8321	.5388	.2691	+90	+ 1
49 Leon., *mult.*	6	4.39	22.4	9 16.7	10 33.8	− 5 39.8	−0.9012	.5387	.2692	− 4	−81
37 Sextantis	6	+4.29	−22.6	+ 7 0.9	15 42.7	− 0 41.2	−0.0179	.5363	−.2723	+43	−43
d Leonis	5	4.17	22.7	4 16.3	22 30.4	+ 5 53.1	+0.8833	.5334	.2756	+90	+ 3
B. A. C. 3836	6	4.07	23.1	2 56.0	25 4 49.0	+11 59.4	+0.4897	.5313	.2774	+73	−19
75 Leonis	5½	4.05	23.2	2 40.8	6 25.4	−10 27.3	+0.2992	.5309	.2777	+61	−28
76 Leonis	6	4.03	23.1	2 19.1	7 12.3	− 9 42.0	+0.4470	.5307	.2778	+70	−21
79 Leonis	5½	+4.01	−23.3	+ 2 4.6	9 38.3	− 7 20.7	+0.0152	.5301	−.2781	+45	−43
υ Leonis	4½	3.91	23.2	− 0 9.1	15 48.4	− 1 22.5	+0.5512	.5289	.2784	+77	−15
χ Virginis	5	3.57	22.8	7 19.5	26 21 39.3	+ 3 31.1	−0.3439	.5200	.2668	+25	−63
B. A. C. 4259	6	3.57	22.8	7 21.6	21 43.1	+ 3 34.8	−0.3245	.5290	.2667	+26	−62
28 Virginis	6	3.55	23.0	6 49.8	22 56.8	+ 4 46.1	−1.1954	.5293	.2659	−26	−90
B. A. C. 4312	6½	+3.50	−22.2	− 9 40.5	27 3 24.9	+ 9 5.6	+0.5290	.5301	−.2623	+72	−16
ψ Virginis	5	3.48	22.5	8 52.6	4 49.9	+10 27.8	−0.6566	.5305	.2610	+ 8	−67
ς Virginis	6	3.44	22.2	10 5.3	11 13.6	− 7 20.9	−1.0686	.5322	.2549	−18	−90
ι Virginis	6	3.36	21.6	12 4.4	20 2.5	+ 1 10.6	−1.2402	.5352	.2450	−33	−90
75 Virginis	6	3.33	20.7	14 44.1	22 52.2	+ 3 54.8	+0.8085	.5363	.2414	+75	− 1
83 Virginis	6	3.30	20.4	15 33.9	28 4 13.9	+ 9 5.7	+0.3877	.5386	.2342	+59	−24
85 Virginis	6	+3.30	−20.5	−15 9.3	4 44.4	+ 9 35.2	−0.1540	.5388	−.2335	+30	−53
B. A. C. 4722	6	3.21	19.3	17 37.9	18 16.1	− 1 20.6	−0.6203	.5451	.2124	+ 4	−86
B. A. C. 4739	6½	3.20	19.1	18 9.0	19 42.6	+ 0 3.0	−0.3875	.5458	.2100	+15	−67
B. A. C. 4923	6	3.14	17.5	20 51.8	29 12 44.4	− 7 30.8	−0.8784	.5546	.1772	−15	−90
B. A. C. 4984	6	3.14	16.5	23 31.1	18 7.5	+ 2 19.2	+0.9665	.5574	.1655	+67	+12
B. A. C. 5023	6	+3.13	−16.7	−21 56.9	20 57.4	+ 0 24.5	−1.1332	.5587	−.1593	−35	−90

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

DECEMBER.

Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1877.0. Δα	Red'ns from 1877.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N'n.	S'n.
		s	″	° ′	d h m	h m				°	°
42 Libræ	4½	+3.09	-15.4	-23 25.3	30 7 5.6	+10 10.6	-1.0917	.5634	-.1354	-34	-90
B. A. C. 5197	6	3.09	15.0	24 19.9	9 25.1	-11 35.0	-0.4456	.5644	.1295	+ 4	-73
b Scorpii	5	3.10	14.6	25 22.8	11 33.2	- 9 31.6	+0.3832	.5652	.1243	+46	-22
A² Scorp., *mult.*	5	3.09	14.6	24 57.7	12 40.0	- 8 27.3	-0.1920	.5656	.1215	+16	-56
B. A. C. 5253	6	3.08	14.8	24 10.1	12 48.2	- 8 19.4	-1.0421	.5657	.1213	-32	-90
B. A. C. 5255	6	+3.09	-14.6	-25 2.8	12 54.9	- 8 12.9	-0.1325	.5657	-.1210	+19	-52
3 Scorpii	6	3.08	14.6	24 53.0	13 6.4	- 8 1.8	-0.3279	.5658	.1205	+ 9	-64
4 Scorpii	6	3.11	14.3	25 54.4	13 26.4	- 7 42.5	+0.7079	.5659	.1195	+64	- 4
B. A. C. 5286	6½	3.07	14.4	24 29.2	14 45.5	- 6 26.4	-0.9395	.5664	.1162	-26	-90
π Scorpii	3	3.09	14.1	25 45.7	14 50.5	- 6 21.6	+0.3903	.5664	.1159	+46	-22
B. A. C. 5314	6	+3.08	-14.1	-25 31.5	16 43.5	- 4 32.8	-0.0725	.5672	-.1157	+21	-48
B. A. C. 5347	5	3.09	13.7	26 0.0	18 41.8	- 2 38.9	+0.2128	.5678	.1060	+35	-32
σ Scorpii	3½	3.07	13.2	25 18.0	31 0 8.3	+ 2 35.5	-1.0632	.5695	.0915	-37	-90
α Scorpii	1½	3.07	12.6	26 9.6	3 31.1	+ 5 50.7	-0.4494	.5704	.0824	- 1	-73
τ Scorpii	3½	3.10	12.0	27 57.7	6 8.9	+ 8 22.6	+1.2465	.5710	.0752	+62	+45
B. A. C. 5800	6½	+3.06	-10.1	-26 50.3	21 56.5	- 0 25.6	-0.7852	.5724	-.0310	-24	-90
A¹ Ophiuchi	5	3.05	10.1	26 25.4	22 26.3	+ 0 3.1	-1.2417	.5724	.0295	-58	-90
A² Ophiuchi	6	3.05	10.1	26 25.3	22 26.4	+ 0 3.2	-1.2431	.5724	.0295	-59	-90
38 Ophiuchi	6½	+3.07	-10.0	-26 29.7	23 21.4	+ 0 56.0	-1.1928	.5724	-.0270	-53	-90

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1877.

Date.	Star's Name.	Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	83 Cancri	6	6 3	11 15	201	148	6 53	12 5	112	64	0 49
2	45 Leonis	6	13 30	18 37	249	296	14 31	19 38	42	93	1 1
5	ψ Virginis	5	11 29	13 24	197	178	12 29	17 25	86	81	1 1
6	85 Virginis	6	13 22	18 13	203	197	14 34	19 25	83	94	1 12
17	σ Aquarii	4½	0 5	4 15	280	304	1 12	5 23	158	194	1 7
20	δ Piscium	4½	6 5	10 3	206	258	Star 5′.9	south of	☽'s	limb.	
25	B. A. C. 1648	6½	3 25	7 3	255	198	4 36	8 14	126	94	1 11
25	B. A. C. 1746	6½	11 6	14 43	197	253	11 19	14 57	159	104	0 14
Feb. 1	χ Virginis	5	15 26	18 35	239	277	16 35	19 44	56	101	1 9
1	B. A. C. 4259	6	15 33	18 42	236	275	16 41	19 50	59	105	1 9
5	π Scorpii †	3	11 0	13 54	294	246	11 43	14 37	17	334	0 44
25	83 Cancri	6	8 48	10 24	239	296	10 3	11 38	56	81	1 15
27	c Leonis*	5	3 31	4 59	286	238	4 9	5 38	27	337	0 39
Mar. 1	ψ Virginis	5	8 47	10 6	200	155	9 39	10 59	88	49	0 52
2	85 Virginis	6	9 11	10 27	148	102	Star 1′.7	south of	☽'s	limb.	
5	τ Scorpii	3½	13 8	14 12	117	180	14 13	15 16	101	75	1 4
19	m Pleiadum	7	9 6	9 15	296	351	10 0	10 10	76	128	0 55
19	e Pleiadum	5	9 30	9 39	186	240	Star 2′.1	south of	☽'s	limb.	
21	136 Tauri	5	12 24	12 25	171	223	Star 0′.8	south of	☽'s	limb.	
28	χ Virginis	5	16 14	15 47	254	297	17 16	16 49	46	94	1 2
28	B. A. C. 4259	6	16 20	15 53	250	294	17 22	16 55	50	99	1 2
Apr. 4	τ Sagittarii	3½	17 55	17 0	315	301	19 14	18 19	69	73	1 19
6	17 Capricorni	6	17 5	16 1	16	336	Star 4′.3	north of	☽'s	limb.	
8	42 Aquarii*	6	16 9	14 58	202	151	Star 0′.3	south of	☽'s	limb.	
9	81 Aquarii†	6	16 26	15 11	276	224	17 23	16 8	135	85	0 57
9	82 Aquarii	6	17 41	16 26	3	313	18 7	16 52	51	2	0 26
17	B. A. C. 1746‡	6½	12 23	10 38	258	308	13 12	11 26	91	136	0 49
19	κ Geminorum	3½	14 0	12 6	265	317	14 48	12 54	67	115	0 48
21	URANUS		14 33	12 31	223	277	15 25	13 24	78	130	0 53
22	45 Leonis	6	11 9	9 4	257	275	12 15	10 10	26	63	1 6
22	49 Leo., *mult.*	6	15 59	13 53	330	22	Star 0′.0	north of	☽'s	limb.	
28	4 Scorpii‡	6	19 41	17 11	276	318	20 47	18 17	72	121	1 6
29	B. A. C. 5603	6½	15 29	12 55	178	164	15 49	13 16	150	140	0 21
May 16	A Geminor.	5½	13 32	9 52	218	271	14 13	10 34	106	155	0 42
28	B. A. C. 6190	6½	15 47	11 19	275	247	17 9	12 42	63	51	1 23
28	B. A. C. 6220	6½	19 10	14 42	328	339	20 9	15 42	54	77	1 0
June 13	μ¹ Cancri‡	6	15 14	9 45	279	326	15 55	10 25	43	86	0 40
15	ν Leonis‡	5	13 55	8 18	259	311	14 50	9 12	38	91	0 55
21	B. A. C. 4984	6	18 12	12 10	183	219	18 36	12 34	147	187	0 24
22	π Scorpii	3	13 48	7 43	336	311	Star 2′.8	north of	☽'s	limb.	
24	B. A. C. 6072	6½	17 29	11 15	310	305	18 42	12 28	56	67	1 13
24	B. A C. 6120*	6½	22 36	16 22	335	22	23 15	17 1	51	101	0 39
30	λ Aquarii†	4	17 11	10 33	250	199	17 56	11 19	165	117	0 45
30	78 Aquarii	6	18 24	11 46	281	234	19 34	12 57	142	102	1 11
July 5	μ Arietis	5½	19 18	12 20	304	257	20 7	13 10	104	53	0 50
6	g Pleiadum	5½	22 0	14 58	267	212	22 51	15 49	139	82	0 51
6	b Pleiadum	4	22 20	15 18	203	147	Star 1′.3	south of	☽'s	limb.	
6	e Pleiadum	5	22 13	15 11	296	240	23 11	16 9	111	53	0 58
6	c Pleiadum	5	22 26	15 24	263	207	23 18	16 16	144	86	0 52
12	7 Leonis	6½	14 51	7 27	200	253	15 40	8 7	103	155	0 40

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1877.

Date.	Star's Name.	Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
July 14	79 Leonis	5½	14 47	7 16	265	310	15 42	8 10	27	76	0 55
20	B. A. C. 5603	6½	18 25	10 29	226	248	19 28	11 32	129	161	1 3
24	B. A. C. 7049	6	23 56	15 44	210	250	Star 0′.0	south of	☽'s	limb.	
25	30 Capricorni	6	0 18	16 2	251	288	1 3	16 47	172	214	0 45
25	31 Capricorni	6½	1 11	16 55	1	44	1 46	17 30	62	109	0 35
28	11 Piscium	6½	1 6	16 38	312	339	2 25	17 57	128	169	1 19
31	104 Piscium	6½	22 50	14 10	292	245	0 6	15 25	143	109	1 15
Aug. 1	26 Arietis	6	1 21	16 37	15	344	1 48	17 3	53	34	0 26
4	B. A. C. 1648	6½	23 28	14 32	12	316	Star 4′.9	north of	☽'s	limb.	
18	B. A. C. 6190	6½	16 33	6 43	309	290	17 46	7 56	54	49	1 13
18	B. A. C. 6220	6½	19 59	10 9	338	359	20 48	10 57	49	79	0 49
24	B. A. C. 8094	6	1 18	15 3	337	8	2 27	16 12	102	144	1 9
29	ε Ariet., *mult.*	4½	21 37	11 3	208	152	Star 0′.5	south of	☽'s	limb.	
Sept. 2	39 Geminor.†	6½	22 39	11 49	238	197	23 23	12 33	95	49	0 44
2	40 Geminor.*	6½	23 13	12 23	179	134	Star 3′.1	south of	☽'s	limb.	
3	μ¹ Cancri	6	0 50	13 56	187	139	1 3	14 9	157	108	0 13
11	B. A. C. 4984‡	6	16 35	5 11	253	297	17 40	6 16	85	135	1 5
20	78 Aquarii	6	18 50	6 50	239	194	19 24	7 24	187	146	0 34
21	21 Piscium‡	6	5 0	16 55	299	350	6 1	17 55	118	169	1 0
22	51 Pisc., *mult.*	6	5 23	17 14	349	40	6 4	17 54	66	118	0 41
25	μ Arietis	5½	20 47	8 27	259	206	21 33	9 13	157	102	0 46
26	*m* Pleiadum	7	2 34	13 39	282	233	3 27	15 2	124	115	1 23
28	B. A. C. 1746	6½	22 54	10 22	302	250	23 47	11 15	97	41	0 53
30	B. A. C. 2514†	6½	23 42	11 2	226	182	0 20	11 40	125	77	0 38
30	κ Gemi., *mult.*	3½	1 32	12 52	292	239	2 24	13 43	57	0	0 52
Oct. 1	39 Cancri*	6	0 41	11 56	198	154	1 4	12 20	140	94	0 24
1	40 Cancri*	6	0 51	12 7	177	132	0 58	12 14	161	115	0 7
2	ψ Leonis	6	3 46	14 57	171	118	3 57	15 8	150	97	0 10
15	31 Capricor.‡	6½	1 39	12 0	302	348	2 41	13 2	119	169	1 2
18	11 Piscium	6½	1 52	12 1	281	317	2 59	13 8	153	197	1 7
18	14 Piscium	6	5 23	15 31	208	259	Star 2′.6	south of	☽'s	limb.	
21	104 Piscium	6½	22 32	8 29	313	264	23 46	9 43	120	81	1 14
23	7 Tauri, *mult.*	6	6 56	16 44	340	38	7 32	17 20	40	98	0 36
25	B. A. C. 1746	6½	8 18	17 59	259	320	9 29	19 10	85	146	1 11
27	A Geminor.	5½	0 40	10 14	259	208	1 35	11 9	96	41	0 55
Nov. 11	20 Capricor.*	6	1 50	10 25	284	333	2 48	11 22	133	185	0 57
12	45 Capricorni	6	0 53	9 24	264	303	1 45	10 16	165	209	0 52
14	B. A. C. 8094	6	4 44	13 6	209	260	Star 2′.6	south of	☽'s	limb.	
15	21 Piscium	6	22 13	6 32	12	347	22 52	7 11	68	53	0 39
19	ε Arietis, *mult.*	4½	22 1	6 5	267	211	22 55	6 59	149	93	0 54
23	39 Geminor.*	6½	23 4	6 52	359	315	Star 5′.1	north of	☽'s	limb.	
23	40 Geminor.†	6½	23 1	6 49	315	271	23 35	7 23	44	357	0 34
24	μ¹ Cancri	6	1 36	9 19	312	260	2 12	9 55	32	338	0 36
26	ν Leonis*	5	2 29	10 4	341	294	Star 2′.3	north of	☽'s	limb.	
Dec. 8	VENUS		0 40	7 29	210	254	Star 0′.4	south of	☽'s	limb.	
9	ι Capricorni	4½	23 8	5 53	283	308	0 18	7 3	148	184	1 10
17	7 Tauri, *mult.*	6	2 13	8 25	25	343	Star 2′.0	north of	☽'s	limb.	
17	*m* Pleiadum	7	7 43	13 55	290	348	8 47	14 59	82	139	1 4
17	*e* Pleiadum	5	8 12	14 24	186	244	Star 2′.6	south of	☽'s	limb.	
19	B. A. C. 1746	6½	1 26	7 31	338	278	2 1	8 6	42	341	0 35

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1877.

Date.	Star's Name.	Magnitude.	IMMERSION. Washington Sidereal Time.	IMMERSION. Washington Mean Time.	IMMERSION. Angle from North Point.	IMMERSION. Angle from Vertex.	EMERSION. Washington Sidereal Time.	EMERSION. Washington Mean Time.	EMERSION. Angle from North Point.	EMERSION. Angle from Vertex.	Duration of Occultation.
			h m	h m	°	°	h m	h m	°	°	h m
Dec. 19	136 Tauri	5	10 29	16 33	351	51	Star 5'.8	north of	☽'s	limb.	
20	40 Geminor.	6½	11 31	17 31	341	40	Star 0'.4	north of	☽'s	limb.	
21	7 Cancri	6½	12 21	18 17	244	301	13 18	19 14	67	122	0 57
22	ε Cancri†	6	0 43	6 36	255	211	1 33	7 26	82	33	0 49
22	42 Cancri†	6½	0 51	6 45	296	251	1 31	7 24	40	351	0 39
22	B. A. C. 2925†	6½	0 54	6 47	267	222	1 43	7 36	69	19	0 49
25	υ Leonis	4½	9 0	14 40	207	170	10 5	15 45	77	53	1 5
29	B. A. C. 4984	6	13 12	18 36	255	288	14 26	19 50	78	121	1 14

NOTES.—B. A. C., British Association Catalogue.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

The *Angles of Position*, for the points of contact, are for *direct* vision, and are reckoned from the Moon's *North Point* towards the West, and from its *Vertex* in the same direction, i. e. towards the right. For *inverted* image, add 180° to the angles given.

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	0	19		II.	Tr.	In.
	2	4		II.	Sh.	Eg.
	3	2		II.	Tr.	Eg.
	8	25		I.	Sh.	In.
	8	53		I.	Tr.	In.
	10	39		I.	Sh	Eg.
	11	8		I.	Tr.	Eg.
2	1	43	25.5	III.	Ec.	Dis.
	5	34	55.3	I.	Ec.	Dis.
	6	2		III.	Oc.	Re.
	8	17		I.	Oc.	Re.
	18	32	59.2	II.	Ec.	Dis.
	22	14		II.	Oc.	Re.
3	2	53		I.	Sh.	In.
	3	24		I.	Tr.	In.
	5	7		I.	Sh.	Eg.
	5	38		I.	Tr.	Eg.
4	0	3	20.1	I.	Ec.	Dis.
	2	47		I.	Oc.	Re.
	12	40		II.	Sh.	In.
	13	44		II.	Tr.	In.
	15	22		II.	Sh.	Eg.
	16	27		II.	Tr.	Eg.
	21	21		I.	Sh.	In.
	21	54		I.	Tr.	In.
	23	35		I.	Sh.	Eg.
5	0	8		I.	Tr.	Eg.
	15	35		III.	Sh.	In.
	17	45		III.	Tr.	In.
	17	56		III.	Sh.	Eg.
	18	31	51.3	I.	Ec.	Dis.
	20	14		III.	Tr.	Eg.
	21	17		I.	Oc.	Re.
6	7	50	18.2	II.	Ec.	Dis.
	11	38		II.	Oc.	Re.
	15	50		I.	Sh.	In.
	16	24		I.	Tr.	In.
	18	4		I.	Sh.	Eg.
	18	38		I.	Tr.	Eg.
7	13	0	16 3	I.	Ec.	Dis.
	15	48		I.	Oc.	Re.
8	1	58		II.	Sh.	In.
	3	9		II.	Tr.	In.
	4	40		II.	Sh.	Eg.
	5	52		II.	Tr.	Eg.
	10	18		I.	Sh.	In.
	10	54		I.	Tr.	In.
	12	32		I.	Sh.	Eg.
	13	8		I.	Tr.	Eg.
9	5	41	24.7	III.	Ec.	Dis.
	7	28	46.3	I.	Ec.	Dis.
	7	51	19.7	III.	Ec.	Re.
	8	0		III.	Oc.	Dis.
	10	18		I.	Oc.	Re.
	10	29		III.	Oc.	Re.
	21	7	24.6	II.	Ec.	Dis.
10	1	2		II.	Oc.	Re.
	4	47		I.	Sh.	In.
	5	24		I.	Tr.	In.
	7	0		I.	Sh.	Eg.
	7	38		I.	Tr.	Eg.
11	1	57	10.0	I.	Ec.	Dis.
	4	48		I.	Oc.	Re.
	15	16		II.	Sh.	In.
	16	33		II.	Tr.	In.
11	17	58		II.	Sh.	Eg.
	19	17		II.	Tr.	Eg.
	23	15		I.	Sh.	In.
	23	54		I.	Tr.	In.
12	1	29		I.	Sh.	Eg.
	2	8		I.	Tr.	Eg.
	19	33		III.	Sh.	In.
	20	25	40.6	I.	Ec.	Dis.
	21	55		III.	Sh.	Eg.
	22	10		III.	Tr.	In.
	23	18		I.	Oc.	Re.
13	0	40		III.	Tr.	Eg.
	10	24	35.8	II.	Ec.	Dis.
	14	26		II.	Oc.	Re.
	17	43		I.	Sh.	In.
	18	24		I.	Tr.	In.
	19	57		I.	Sh.	Eg.
	20	38		I.	Tr.	Eg.
14	14	54	5.3	I.	Ec.	Dis.
	17	48		I.	Oc.	Re.*
15	4	34		II.	Sh.	In.
	5	57		II.	Tr.	In.
	7	16		II.	Sh.	Eg.
	8	41		II.	Tr.	Eg.
	12	12		I.	Sh.	In.
	12	54		I.	Tr.	In.
	14	26		I.	Sh.	Eg.
	15	8		I.	Tr.	Eg.
16	9	22	34.1	I.	Ec.	Dis.
	9	39	33.0	III.	Ec.	Dis.
	11	50	33.0	III.	Ec.	Re.
	12	18		I.	Oc.	Re.
	12	25		III.	Oc.	Dis.
	14	54		III.	Oc.	Re.
	23	41	37.7	II.	Ec.	Dis.
17	3	49		II.	Oc.	Re.
	6	40		I.	Sh.	In.
	7	24		I.	Tr.	In.
	8	54		I.	Sh.	Eg.
	9	38		I.	Tr.	Eg.
18	3	50	56.7	I.	Ec.	Dis.
	6	48		I.	Oc.	Re.
	17	52		II.	Sh.	In.*
	19	21		II.	Tr.	In.
	20	34		II.	Sh.	Eg.
	22	5		II.	Tr.	Eg.
19	1	8		I.	Sh.	In.
	1	54		I.	Tr.	In.
	3	23		I.	Sh.	Eg.
	4	8		I.	Tr.	Eg.
	22	19	26.7	I.	Ec.	Dis.
	23	30		III.	Sh.	In.
20	1	18		I.	Oc.	Re.
	1	53		III.	Sh.	Eg.
	2	34		III.	Tr.	In.
	5	4		III.	Tr.	Eg.
	12	58	41.9	II.	Ec.	Dis.
	17	12		II.	Oc.	Re.
	19	37		I.	Sh.	In.
	20	24		I.	Tr.	In.
	21	51		I.	Sh.	Eg.
	22	38		I.	Tr.	Eg.
21	16	47	50.9	I.	Ec.	Dis.
	19	48		I.	Oc.	Re.
22	7	10		II.	Sh.	In.
	8	45		II.	Tr.	In.
	9	52		II.	Sh.	Eg.
	11	29		II.	Tr.	Eg.
	14	5		I.	Sh.	In.
	14	53		I.	Tr.	In.
	16	20		I.	Sh.	Eg.
	17	8		I.	Tr.	Eg.
23	11	16	19.2	I.	Ec.	Dis.
	13	37	6.7	III.	Ec.	Dis.
	14	18		I.	Oc.	Re.
	15	49	12.1	III.	Ec.	Re.
	16	47		III.	Oc.	Dis.
	19	18		III.	Oc.	Re.
24	2	15	38.8	II.	Ec.	Dis.
	6	35		II.	Oc	Re.
	8	33		I.	Sh.	In.
	9	23		I.	Tr.	In.
	10	48		I.	Sh.	Eg.
	11	38		I.	Tr.	Eg.
25	5	44	41.3	I.	Ec.	Dis.
	8	48		I.	Oc.	Re.
	20	27		II.	Sh.	In.
	22	8		II.	Tr.	In.
	23	10		II.	Sh.	Eg.
26	0	53		II.	Tr.	Eg.
	3	2		I.	Sh.	In.
	3	53		I.	Tr.	In.
	5	17		I.	Sh.	Eg.
	6	8		I.	Tr.	Eg.
27	0	13	10.7	I.	Ec.	Dis.
	3	18		I.	Oc.	Re.
	3	29		III.	Sh.	In.
	5	53		III.	Sh.	Eg.
	6	56		III.	Tr.	In.
	9	27		III.	Tr.	Eg.
	15	32	36.3	II.	Ec.	Dis.
	19	58		II.	Oc.	Re.
	21	30		I.	Sh.	In.
	22	23		I.	Tr.	In.
	23	45		I.	Sh.	Eg.
28	0	38		I.	Tr.	Eg.
	18	41	34.2	I.	Ec.	Dis.
	21	48		I.	Oc.	Re.
29	9	45		II.	Sh.	In.
	11	31		II.	Tr.	In.
	12	28		II.	Sh.	Eg.
	14	16		II.	Tr.	Eg.
	15	58		I.	Sh.	In.
	16	53		I.	Tr.	In.
	18	13		I.	Sh.	Eg.
	19	7		I.	Tr.	Eg.
30	13	10	2.2	I.	Ec.	Dis.
	16	17		I.	Oc.	Re.
	17	34	32.2	III.	Ec.	Dis.*
	19	47	43.6	III.	Ec.	Re.
	21	8		III.	Oc.	Dis.
	23	40		III.	Oc.	Re.
31	4	49	28.9	II.	Ec.	Dis.
	9	20		II.	Oc.	Re.
	10	27		I.	Sh.	In.
	11	22		I.	Tr.	In.
	12	42		I.	Sh.	Eg.
	13	37		I.	Tr.	Eg.

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

FEBRUARY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	7	38	23.7	I.	Ec.	Dis.	10	18	7		III.	Tr.	Eg.	19	23	53		I.	Sh.	Eg.
	10	47		I.	Oc.	Re.		20	39	54.3	II.	Ec.	Dis.	20	1	1		I.	Tr.	Eg.
	23	3		II.	Sh.	In.	11	1	17		I.	Sh.	In.		18	50	59.9	I.	Ec.	Dis.
2	0	54		II.	Tr.	In.		1	26		II.	Oc.	Re.		22	12		I.	Oc.	Re.
	1	46		II.	Sh.	Eg.		2	20		I.	Tr.	In.	21	5	28	0.4	III.	Ec.	Dis.
	3	39		II.	Tr.	Eg.		3	32		I.	Sh.	Eg.		7	44	32.8	III.	Ec.	Re.
	4	55		I.	Sh.	In.		4	35		I.	Tr.	Eg.		9	58		III.	Oc.	Dis.
	5	52		I.	Tr.	In.		22	28	54.9	I.	Ec.	Dis.		12	30	1.4	II.	Ec.	Dis.
	7	10		I.	Sh.	Eg.	12	1	45		I.	Oc.	Re.		12	33		III.	Oc.	Re.
	8	7		I.	Tr.	Eg.		14	57		II.	Sh.	In.		16	7		I.	Sh.	In.*
3	2	6	52.6	I.	Ec.	Dis.		17	2		II.	Tr.	In.*		17	15		I.	Tr.	In.*
	5	17		I.	Oc.	Re.		17	40		II.	Sh.	Eg.*		17	28		II.	Oc.	Re.*
	7	26		III.	Sh.	In.		19	45		I.	Sh.	In.		18	21		I.	Sh.	Eg.
	9	52		III.	Sh.	Eg.		19	47		II.	Tr.	Eg.		19	30		I.	Tr.	Eg.
	11	16		III.	Tr.	In.		20	49		I.	Tr.	In.	22	13	19	19.8	I.	Ec.	Dis.
	13	48		III.	Tr.	Eg.		22	0		I.	Sh.	Eg.		16	42		I.	Oc.	Re.
	18	6	20.1	II.	Ec.	Dis.		23	4		I.	Tr.	Eg.	23	6	50		II.	Sh.	In.
	22	42		II.	Oc.	Re.	13	16	57	22.3	I.	Ec.	Dis.*		9	8		II.	Tr.	In.
	23	23		I.	Sh.	In.		20	15		I.	Oc	Re.		9	34		II.	Sh.	Eg.
4	0	22		I.	Tr.	In.	14	1	29	45.4	III.	Ec.	Dis		10	35		I.	Sh	In.
	1	39		I.	Sh.	Eg.		3	45	10.2	III.	Ec.	Re.		11	44		I.	Tr.	In.
	2	37		I.	Tr.	Eg.		5	44		III.	Oc.	Dis.		11	53		II.	Tr.	Eg.
	20	35	15.5	I.	Ec.	Dis.		8	17		III.	Oc.	Re.		12	49		I.	Sh.	Eg.
	23	47		I.	Oc.	Re.		9	56	39.0	II.	Ec.	Dis.		13	59		I.	Tr.	Eg.
5	12	21		II.	Sh.	In.		14	13		I.	Sh.	In.	24	7	47	47.3	I.	Ec.	Dis.
	14	17		II.	Tr.	In.		14	47		II:	Oc.	Re.		11	11		I.	Oc.	Re.
	15	4		II.	Sh.	Eg.		15	19		I.	Tr.	In.		19	18		III.	Sh.	In.
	17	2		II.	Tr.	Eg.*		16	29		I.	Sh.	Eg.*		21	47		III.	Sh.	Eg.
	17	51		I.	Sh.	In.*		17	34		I.	Tr.	Eg.*	25	0	0		III.	Tr.	In.
	18	51		I.	Tr.	In.	15	11	25	42.6	I.	Ec.	Dis.		1	46	38.7	II.	Ec.	Dis.
	20	7		I.	Sh.	Eg.		14	44		I.	Oc.	Re.		2	35		III.	Tr.	Eg.
	21	6		I.	Tr.	Eg.	16	4	15		II.	Sh.	In.		5	3		I.	Sh.	In.
6	15	3	43.2	I.	Ec.	Dis.		6	24		II.	Tr.	In.		6	13		I.	Tr.	In.
	18	16		I.	Oc.	Re.		6	58		II.	Sh.	Eg.		6	48		II.	Oc.	Re.
	21	32	7.2	III.	Ec.	Dis.		8	42		I.	Sh.	In.		7	18		I.	Sh.	Eg.
	23	46	25.0	III.	Ec.	Re.		9	9		II.	Tr.	Eg.		8	28		I.	Tr.	Eg.
7	1	27		III.	Oc.	Dis.		9	48		I.	Tr.	In.	26	2	16	9.0	I.	Ec.	Dis.
	3	59		III.	Oc.	Re.		10	57		I.	Sh.	Eg.		5	40		I.	Oc.	Re.
	7	23	8.5	II.	Ec.	Dis.		12	3		I.	Tr.	Eg.		20	8		II.	Sh.	In.
	12	4		II.	Oc.	Re.	17	5	54	10.7	I.	Ec.	Dis.		22	29		II.	Tr.	In.
	12	20		I.	Sh.	In.		9	13		I.	Oc.	Re.		22	52		II.	Sh.	Eg.
	13	21		I.	Tr.	In.		15	21		III.	Sh.	In.		23	31		I.	Sh.	In.
	14	36		I.	Sh.	Eg.		17	48		III.	Sh.	Eg.	27	0	42		I.	Tr.	In.
	15	36		I.	Tr.	Eg.		19	49		III.	Tr.	In.		1	14		II.	Tr.	Eg.
8	9	32	4.2	I.	Ec.	Dis.		22	23		III.	Tr.	Eg.		1	44		I.	Sh.	Eg.
	12	46		I.	Oc.	Re.		23	13	20.3	II.	Ec.	Dis.		2	57		I.	Tr.	Eg.
9	1	39		II.	Sh.	In.	18	3	10		I.	Sh.	In.		20	44	36.1	I.	Ec.	Dis.
	3	40		II.	Tr.	In.		4	8		II.	Oc.	Re.	28	0	9		I.	Oc.	Re.
	4	22		II.	Sh.	Eg.		4	17		I.	Tr.	In.		9	25	43.5	III.	Ec.	Dis.
	6	25		II.	Tr.	Eg.		5	25		I.	Sh.	Eg.		11	43	24.1	III.	Ec.	Re.
	6	48		I.	Sh.	In.		6	32		I.	Tr.	Eg.		14	9		III.	Oc.	Dis.
	7	50		I.	Tr.	In.	19	0	22	32.7	I.	Ec.	Dis.		15	3	16.4	II.	Ec.	Dis.
	9	4		I.	Sh.	Eg.		3	43		I.	Oc.	Re.		16	44		III.	Oc.	Re.*
	10	5		I.	Tr.	Eg.		17	32		II.	Sh.	In.*		18	0		I.	Sh.	In.
10	4	0	32.6	I.	Ec.	Dis.		19	46		II.	Tr.	In.		19	11		I.	Tr.	In.
	7	16		I.	Oc.	Re.		20	16		II.	Sh.	Eg.		20	8		II.	Oc.	Re.
	11	24		III.	Sh.	In.		21	38		I.	Sh.	In.		20	15		I.	Sh.	Eg.
	13	50		III.	Sh.	Eg.		22	31		II.	Tr.	Eg.		21	26		I.	Tr.	Eg.
	15	34		III.	Tr.	In.		22	46		I.	Tr.	In.							

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance. *Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

d	h	m	s			
1	15	12	55.8	I.	Ec.	Dis.
	18	38		I.	Oc.	Re.
2	9	26		II.	Sh.	In.
	11	50		II.	Tr.	In.
	12	10		II.	Sh.	Eg.
	12	28		I.	Sh.	In.
	13	40		I.	Tr.	In.
	14	35		II.	Tr.	Eg.
	14	43		I.	Sh.	Eg.
	15	55		I.	Tr.	Eg.*
3	9	41	23.3	I.	Ec.	Dis.
	13	7		I.	Oc.	Re.
	23	15		III.	Sh.	In.
4	1	44		III.	Sh.	Eg.
	4	9		III.	Tr.	In.
	4	19	50.8	II.	Ec.	Dis.
	6	45		III.	Tr.	Eg.
	6	56		I.	Sh.	In.
	8	9		I.	Tr.	In.
	9	11		I.	Sh.	Eg.
	9	27		II.	Oc.	Re.
	10	24		I.	Tr.	Eg.
5	4	9	44.7	I.	Ec.	Dis.
	7	36		I.	Oc.	Re.
	22	44		II.	Sh.	In.
6	1	10		II.	Tr.	In.
	1	24		I.	Sh.	In.
	1	28		II.	Sh.	Eg.
	2	38		I.	Tr.	In.
	3	39		I.	Sh.	Eg.
	3	55		II.	Tr.	Eg.
	4	53		I.	Tr.	Eg.
	22	38	11.6	I.	Ec.	Dis.
7	2	5		I.	Oc.	Re.
	13	23	36.9	III.	Ec.	Dis.
	15	42	26.1	III.	Ec.	Re.*
	17	36	26.1	II.	Ec.	Dis.
	18	16		III.	Oc.	Dis.
	19	52		I.	Sh.	In.
	20	53		III.	Oc.	Re.
	21	7		I.	Tr.	In.
	22	8		I.	Sh.	Eg.
	22	46		II.	Oc.	Re.
	23	22		I.	Tr.	Eg.
8	17	6	30.9	I.	Ec.	Dis.*
	20	34		I.	Oc.	Re.
9	12	2		II.	Sh.	In.
	14	20		I.	Sh.	In.
	14	30		II.	Tr.	In.
	14	46		II.	Sh.	Eg.
	15	36		I.	Tr.	In.*
	16	36		I.	Sh.	Eg.*
	17	15		II.	Tr.	Eg.*
	17	50		I.	Tr.	Eg.
10	11	34	58.4	I.	Ec.	Dis.
	15	3		I.	Oc.	Re.
11	3	12		III.	Sh.	In.
	5	43		III.	Sh.	Eg.
	6	52	58.3	II.	Ec.	Dis.
	8	15		III.	Tr.	In.
	8	48		I.	Sh.	In.
	10	5		I.	Tr.	In.
	10	52		III.	Tr.	Eg.
11	11	4		I.	Sh.	Eg.
	12	4		II.	Oc.	Re.
	12	19		I.	Tr.	Eg.
12	6	3	19.8	I.	Ec.	Dis.
	9	32		I.	Oc.	Re.
13	1	20		II.	Sh.	In.
	3	17		I.	Sh.	In.
	3	49		II.	Tr.	In.
	4	5		II.	Sh.	Eg.
	4	34		I.	Tr.	In.
	5	32		I.	Sh.	Eg.
	6	35		II.	Tr.	Eg.
	6	48		I.	Tr.	Eg.
14	0	31	46.7	I.	Ec.	Dis
	4	1		I.	Oc.	Re.
	17	20	59.7	III.	Ec.	Dis.*
	19	40	57.7	III.	Ec.	Re.
	20	9	31.4	II.	Ec.	Dis.
	21	45		I.	Sh.	In.
	22	21		III.	Oc.	Dis.
	23	2		I.	Tr.	In.
15	0	0		I.	Sh.	Eg.
	0	59		III.	Oc.	Re.
	1	17		I.	Tr.	Eg.
	1	22		II.	Oc.	Re.
	19	0	6.1	I.	Ec.	Dis.
	22	30		I.	Oc	Re.
16	14	38		II.	Sh.	In.*
	16	13		I.	Sh.	In.*
	17	8		II.	Tr.	In.*
	17	23		II.	Sh.	Eg.
	17	30		I.	Tr.	In.
	18	28		I.	Sh.	Eg.
	19	45		I.	Tr.	Eg.
	19	54		II.	Tr.	Eg.
17	13	28	33.5	I.	Ec.	Dis.
	16	58		I.	Oc.	Re.*
18	7	11		III.	Sh.	In.
	9	26	2.7	II.	Ec.	Dis.
	9	42		III.	Sh.	Eg.
	10	41		I.	Sh.	In.
	11	59		I.	Tr.	In.
	12	18		III.	Tr.	In.
	12	57		I.	Sh.	Eg.
	14	14		I.	Tr.	Eg.
	14	40		II.	Oc.	Re.*
	14	56		III.	Tr.	Eg.*
19	7	56	54.9	I.	Ec.	Dis.
	11	27		I.	Oc.	Re.
20	3	56		II.	Sh.	In.
	5	10		I.	Sh.	In.
	6	27		I.	Tr.	In.
	6	27		II.	Tr.	In.
	6	41		II.	Sh.	Eg.
	7	25		I.	Sh.	Eg.
	8	42		I.	Tr.	Eg.
	9	13		II.	Tr.	Eg.
21	2	25	22.0	I.	Ec.	Dis.
	5	55		I.	Oc.	Re.
	21	18	17.9	III.	Ec.	Dis.
	22	42	34.2	II.	Ec.	Dis.
	23	38		I.	Sh.	In.
	23	39	24.9	III.	Ec.	Re.
22	0	55		I.	Tr.	In.
	1	54		I.	Sh.	Eg.
	2	22		III.	Oc.	Dis.
	3	10		I.	Tr.	Eg.
	3	57		II.	Oc.	Re.
	5	0		III.	Oc.	Re.
	20	53	41.3	I.	Ec.	Dis.
23	0	24		I.	Oc.	Re.
	17	14		II.	Sh.	In.*
	18	6		I.	Sh.	In.
	19	23		I.	Tr.	In.
	19	45		II.	Tr.	In.
	19	59		II.	Sh.	Eg.
	20	22		I.	Sh.	Eg.
	21	39		I.	Tr.	Eg.
	22	31		II.	Tr.	Eg.
24	15	22	8.6	I.	Ec.	Dis.*
	18	52		I.	Oc.	Re.
25	11	8		III.	Sh.	In.
	11	59	4.8	II.	Ec.	Dis.
	12	35		I.	Sh.	In.
	13	41		III.	Sh	Eg.
	13	51		I.	Tr.	In.
	14	50		I.	Sh.	Eg.*
	16	7		I.	Tr.	Eg.*
	16	16		III.	Tr.	In.*
	17	13		II.	Oc.	Re.*
	18	55		III.	Tr.	Eg.
26	9	50	30.1	I.	Ec.	Dis.
	13	21		I.	Oc.	Re.
27	6	32		II.	Sh.	In.
	7	3		I.	Sh.	In.
	8	19		I.	Tr.	In.
	9	3		II.	Tr.	In.
	9	17		II.	Sh.	Eg.
	9	18		I.	Sh.	Eg.
	10	35		I.	Tr.	Eg.
	11	49		II.	Tr.	Eg
28	4	18	57.4	I.	Ec.	Dis.
	7	49		I.	Oc.	Re.
29	1	15	35.6	II.	Ec.	Dis.
	1	15	50.8	III.	Ec.	Dis.
	1	31		I.	Sh.	In.
	2	47		I.	Tr.	In.
	3	38	7.0	III.	Ec.	Re.
	3	47		I.	Sh.	Eg.
	5	3		I.	Tr.	Eg.
	6	18		III.	Oc.	Dis.
	6	29		II.	Oc.	Re.
	8	57		III.	Oc.	Re.
	22	47	17.0	I.	Ec.	Dis.
30	2	17		I.	Oc.	Re.
	19	50		II.	Sh.	In.
	20	0		I.	Sh.	In.
	21	15		I.	Tr.	In.
	22	15		I.	Sh.	Eg.
	22	20		II.	Tr.	In.
	22	35		II.	Sh.	Eg.
	23	31		I.	Tr.	In.
31	1	6		II.	Tr.	Eg.
	17	15	44.5	I.	Ec.	Dis
	20	45		I.	Oc.	Re.

NOTE.—For Phases of Eclipses see pages 462 and 463 * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s				d	h	m	s				d	h	m	s			
1	14	28		I.	Sh.	In.*	10	16	56		II.	Tr.	Eg.*	21	5	3		I.	Tr.	Eg.
	14	32	6.2	II.	Ec.	Dis.*	11	8	6	12.0	I.	Ec.	Dis.		5	53		II.	Tr.	In.
	15	6		III.	Sh.	In.*		11	33		I.	Oc.	Re.		6	25		II.	Sh.	Eg.
	15	43		I.	Tr.	In.*	12	5	17		I.	Sh.	In.		8	40		II.	Tr.	Eg.
	16	44		I.	Sh.	Eg.*		6	21	41.6	II.	Ec.	Dis.		22	56	42.3	I.	Ec.	Dis.
	17	40		III.	Sh.	Eg.		6	31		I.	Tr.	In.	22	2	18		I.	Oc.	Re.
	17	59		I.	Tr.	Eg.		7	33		I.	Sh.	Eg.		20	7		I.	Sh.	In.
	19	45		II.	Oc.	Re.		8	46		I.	Tr.	Eg		21	14		I.	Tr.	In.
	20	11		III.	Tr.	In.		9	11	48.9	III.	Ec.	Dis.		22	11	26.5	II.	Ec.	Dis.
	22	50		III.	Tr.	Eg.		11	28		II.	Oc.	Re.		22	22		I.	Sh.	Eg.
2	11	44	6.3	I.	Ec.	Dis.		11	36	24.1	III.	Ec.	Re.		23	30		I.	Tr.	Eg.
	15	13		I.	Oc.	Re.*		13	59		III.	Oc.	Dis.*	23	2	57		III.	Sh.	In.
3	8	56		I.	Sh.	In.		16	39		III.	Oc.	Re.*		3	7		II.	Oc.	Re.
	9	8		II.	Sh.	In.	13	2	34	32.2	I.	Ec.	Dis.		5	35		III.	Sh.	Eg.
	10	11		I.	Tr.	In.		6	1		I.	Oc.	Re.		7	26		III.	Tr.	In.
	11	12		I.	Sh.	Eg.		23	45		I.	Sh.	In.		10	7		III.	Tr.	Eg.
	11	37		II.	Tr.	In.	14	0	58		I.	Tr.	In.		17	25	5.8	I.	Ec.	Dis.
	11	54		II.	Sh.	Eg.		1	3		II.	Sh.	In.		20	45		I.	Oc.	Re.
	12	27		I.	Tr.	Eg.		2	1		I.	Sh.	Eg.	24	14	35		I.	Sh.	In.*
	14	23		II.	Tr.	Eg.		3	14		I.	Tr.	Eg.		15	41		I.	Tr.	In.*
4	6	12	34.0	I.	Ec.	Dis.		3	24		II.	Tr.	In.		16	50		I.	Sh.	Eg.
	9	41		I.	Oc.	Re.		3	48		II.	Sh.	Eg.		16	57		II.	Sh	In.
5	3	24		I.	Sh.	In.		6	11		II.	Tr.	Eg.		17	57		I.	Tr.	Eg
	3	48	37.2	II.	Ec.	Dis.		21	3	0.6	I.	Ec.	Dis		19	7		II.	Tr.	In.
	4	39		I.	Tr.	In.	15	0	28		I.	Oc.	Re.		19	43		II.	Sh.	Eg.
	5	13	29.7	III.	Ec.	Dis.		18	13		I.	Sh.	In.		21	54		II.	Tr.	Eg.
	5	40		I.	Sh.	Eg.		19	25		I.	Tr.	In.	25	11	53	35.5	I.	Ec.	Dis.
	6	55		I.	Tr.	Eg.		19	38	15.7	II.	Ec.	Dis.		15	13		I.	Oc.	Re.*
	7	36	55.3	III.	Ec.	Re.		20	29		I.	Sh.	Eg.	26	9	4		I.	Sh.	In.
	9	0		II.	Oc.	Re.		21	41		I.	Tr.	Eg.		10	8		I.	Tr.	In.
	10	10		III.	Oc.	Dis.		23	0		III.	Sh.	In.		11	19		I.	Sh.	Eg.
	12	50		III.	Oc.	Re.	16	0	42		II.	Oc	Re.		11	28	3.0	II.	Ec.	Dis.
6	0	40	53.8	I.	Ec.	Dis.		1	36		III.	Sh.	Eg.		12	24		I.	Tr.	Eg.*
	4	9		I.	Oc.	Re.		3	46		III.	Tr.	In.		16	19		II.	Oc	Re.*
	21	52		I.	Sh.	In.		6	26		III.	Tr.	Eg.		17	7	42.2	III.	Ec.	Dis.
	22	27		II.	Sh.	In.		15	31	23.5	I.	Ec.	Dis.*		19	34	36.2	III.	Ec.	Re.
	23	7		I	Tr.	In.		18	56		I.	Oc.	Re.		21	22		III.	Oc.	Dis.
7	0	8		I.	Sh.	Eg.	17	12	42		I.	Sh.	In.*	27	0	3		III.	Oc.	Re.
	0	53		II.	Tr.	In.		13	52		I.	Tr.	In.*		6	21	57.5	I.	Ec.	Dis.
	1	12		II.	Sh.	Eg.		14	21		II.	Sh.	In.*		9	40		I.	Oc.	Re.
	1	22		I.	Tr.	Eg.		14	57		I.	Sh.	Eg.*	28	3	32		I.	Sh.	In.
	3	40		II.	Tr.	Eg.		16	8		I.	Tr.	Eg.*		4	35		I.	Tr.	In.
	19	9	21.5	I.	Ec.	Dis.		16	39		II.	Tr.	In.*		5	47		I.	Sh.	Eg.
	22	37		I.	Oc.	Re.		17	6		II.	Sh.	Eg.		6	15		II.	Sh.	In.
8	16	20		I.	Sh.	In.*		19	26		II.	Tr.	Eg.		6	51		I.	Tr.	Eg.
	17	5	9.6	II.	Ec.	Dis.	18	9	59	52.5	I.	Ec.	Dis.		8	20		II.	Tr.	In.
	17	35		I.	Tr.	In.		13	23		I.	Oc.	Re.*		9	1		II.	Sh.	Eg.
	18	37		I.	Sh.	Eg.	19	7	10		I.	Sh.	In.		11	7		II.	Tr.	Eg.
	19	3		III.	Sh.	In.		8	20		I.	Tr.	In.	29	0	50	26.8	I.	Ec.	Dis.
	19	51		I.	Tr.	Eg.		8	54	49.9	II.	Ec.	Dis.		4	7		I.	Oc.	Re.
	21	38		III.	Sh.	Eg.		9	26		I.	Sh.	Eg.		22	0		I.	Sh.	In.
	22	14		II.	Oc.	Re.		10	36		I.	Tr.	Eg.		23	2		I.	Tr.	In.
9	0	0		III.	Tr.	In.		13	9	39.1	III.	Ec.	Dis.*	30	0	16		I.	Sh.	Eg.
	2	41		III.	Tr.	Eg.		13	55		II.	Oc.	Re.*		0	44	43.0	II.	Ec.	Dis.
	13	37	43.7	I.	Ec.	Dis.*		15	35	23.7	III.	Ec.	Re.*		1	18		I.	Tr.	Eg
	17	5		I.	Oc.	Re.		17	43		III.	Oc.	Dis.		5	31		II.	Oc.	Re.
10	10	48		I.	Sh.	In.		20	23		III.	Oc.	Re.		6	55		III.	Sh.	In.
	11	45		II.	Sh.	In.	20	4	28	13.6	I.	Ec.	Dis.		9	33		III.	Sh.	Eg.
	12	3		I.	Tr.	In.		7	51		I.	Oc.	Re.		11	3		III.	Tr.	In.
	13	5		I.	Sh.	Eg.*	21	1	38		I.	Sh.	In.		13	44		III.	Tr.	Eg.*
	14	9		II.	Tr.	In.*		2	47		I.	Tr.	In.		19	18	51.1	I.	Ec.	Dis.
	14	18		I.	Tr.	Eg.*		3	39		II.	Sh.	In.		22	34		I.	Oc.	Re.
	14	30		II.	Sh.	Eg.*		3	54		I.	Sh.	Eg.							

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance. * Visible at Washington.

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MAY.

d	h	m	s			
1	16	28		I.	Sh.	In.*
	17	29		I.	Tr.	In.
	18	44		I.	Sh.	Eg.
	19	33		II.	Sh.	In.
	19	45		I.	Tr.	Eg.
	21	32		II.	Tr.	In.
	22	20		II.	Sh.	Eg.
2	0	19		II.	Tr.	Eg.
	13	47	21.6	I.	Ec.	Dis.*
	17	1		I.	Oc.	Re.
3	10	56		I.	Sh.	In.
	11	56		I.	Tr.	In.*
	13	12		I.	Sh.	Eg.*
	14	1	23.5	II.	Ec.	Dis.*
	14	12		I.	Tr.	Eg.*
	18	41		II.	Oc.	Re.
	21	5	20.0	III.	Ec.	Dis.
	23	33	23.4	III.	Ec.	Re.
4	0	56		III.	Oc.	Dis.
	3	37		III.	Oc.	Re.
	8	15	44.5	I.	Ec.	Dis.
	11	28		I.	Oc.	Re.
5	5	25		I.	Sh.	In.
	6	23		I.	Tr.	In.
	7	40		I.	Sh.	Eg.
	8	39		I.	Tr.	Eg.
	8	51		II.	Sh.	In.
	10	44		II.	Tr.	In.
	11	38		II.	Sh.	Eg.*
	13	31		II.	Tr.	Eg.*
6	2	44	14.9	I.	Ec.	Dis.
	5	54		I.	Oc.	Re.
	23	53		I.	Sh.	In.
7	0	50		I.	Tr.	In.
	2	9		I.	Sh.	Eg.
	3	5		I.	Tr.	Eg.
	3	18	7.6	II.	Ec.	Dis.
	7	52		II.	Oc.	Re.
	10	53		III.	Sh.	In.
	13	33		III.	Sh.	Eg.*
	14	36		III.	Tr.	In.
	17	17		III.	Tr.	Eg.
	21	12	40.2	I.	Ec.	Dis.
8	0	21		I.	Oc.	Re.
	18	21		I.	Sh.	In.
	19	16		I.	Tr.	In.
	20	37		I.	Sh.	Eg.
	21	31		I.	Tr.	Eg.
	22	9		II.	Sh.	In.
	23	56		II.	Tr.	In.
9	0	56		II.	Sh.	Eg.
	2	43		II.	Tr.	Eg.
	15	41	11.8	I.	Ec.	Dis.*
	18	48		I.	Oc.	Re.
10	12	50		I.	Sh.	In.*
	13	43		I.	Tr.	In.*
	15	6		I.	Sh.	Eg.*
	15	58		I.	Tr.	Eg.*
	16	34	52.7	II.	Ec.	Dis.
	21	2		II.	Oc.	Re.
11	1	2	58.4	III.	Ec.	Dis.
	3	32	11.2	III.	Ec.	Re.
	4	27		III.	Oc.	Dis.
11	7	8		III.	Oc.	Re.
	10	9	35.8	I.	Ec.	Dis.
	13	15		I.	Oc.	Re.*
12	7	18		I.	Sh.	In.
	8	10		I.	Tr.	In.
	9	34		I.	Sh.	Eg.
	10	24		I.	Tr.	Eg.
	11	28		II.	Sh.	In.*
	13	7		II.	Tr.	In.*
	14	14		II.	Sh.	Eg.*
	15	54		II.	Tr.	Eg *
13	4	38	7.1	I.	Ec.	Dis.
	7	41		I.	Oc.	Re.
14	1	46		I.	Sh.	In.
	2	36		I.	Tr.	In.
	4	2		I.	Sh.	Eg.
	4	51		I.	Tr.	Eg.
	5	51	41.4	II.	Ec.	Dis
	10	11		II.	Oc.	Re.
	14	51		III.	Sh.	In.*
	17	32		III.	Sh.	Eg.
	18	4		III.	Tr.	In.
	20	46		III.	Tr.	Eg.
	23	6	33.7	I.	Ec.	Dis.
15	2	8		I.	Oc.	Re.
	20	14		I.	Sh.	In.
	21	2		I.	Tr.	In.
	22	30		I.	Sh.	Eg.
	23	17		I.	Tr.	Eg.
16	0	46		II.	Sh.	In.
	2	17		II.	Tr.	In.
	3	32		II.	Sh.	Eg.
	5	4		II.	Tr.	Eg.
	17	35	6.3	I.	Ec.	Dis.
	20	34		I.	Oc	Dis.
17	14	43		I.	Sh.	In.*
	15	28		I.	Tr.	In.*
	16	59		I.	Sh.	Eg.
	17	44		I.	Tr.	Eg.
	19	8	32.2	II.	Ec.	Dis.
	23	20		II.	Oc.	Re.
18	5	0	57.6	III.	Ec.	Dis
	7	31	19.8	III.	Ec.	Re.
	7	53		III.	Oc.	Dis.
	10	34		III.	Oc.	Re.
	12	3	31.6	I.	Ec.	Dis.*
	15	1		I.	Oc.	Re.*
19	9	11		I.	Sh.	In.
	9	54		I.	Tr.	In.
	11	27		I.	Sh.	Eg.*
	12	10		I.	Tr.	Eg.*
	14	4		II.	Sh.	In.*
	15	27		II.	Tr.	In.*
	16	50		II.	Sh.	Eg.
	18	14		II.	Tr.	Eg
20	6	32	3.9	I.	Ec.	Dis.
	9	27		I.	Oc.	Re.
21	3	40		I.	Sh.	In.
	4	20		I.	Tr.	In.
	5	56		I.	Sh.	Eg.
	6	36		I.	Tr.	Eg.
	8	25	25.9	II.	Ec.	Dis.
	12	29		II.	Oc.	Re.*
21	18	49		III.	Sh.	In.
	21	29		III.	Tr.	In.
	21	31		III.	Sh.	Eg.
22	0	11		III.	Tr.	Eg.
	1	0	31.7	I.	Ec.	Dis.
	3	54		I.	Oc.	Re.
	22	8		I.	Sh.	In.
	22	46		I.	Tr.	In.
23	0	24		I.	Sh.	Eg.
	1	2		I.	Tr.	Eg
	3	22		II.	Sh.	In.
	4	37		II.	Tr.	In.
	6	8		II.	Sh.	Eg.
	7	24		II.	Tr.	Eg.
	19	29	5.7	I.	Ec.	Dis.
	22	20		I.	Oc.	Re.
24	16	37		I.	Sh.	In.
	17	13		I.	Tr.	In.
	18	52		I.	Sh	Eg
	19	28		I.	Tr.	Eg.
	21	42	22.7	II.	Ec.	Dis.
25	1	37		II.	Oc.	Re.
	8	59	6.5	III.	Ec.	Dis.
	13	57	32.5	I.	Ec.	Dis.
	13	58		III.	Oc.	Re.
	16	46		I.	Oc.	Re.
26	11	5		I.	Sh.	In.
	11	39		I.	Tr.	In.
	13	20		I.	Sh.	Eg.
	13	54		I.	Tr.	Eg.
	16	40		II.	Sh.	In.
	17	46		II.	Tr.	In.
	19	26		II.	Sh.	Eg.
	20	33		II.	Tr.	Eg.
27	8	26	6.2	I.	Ec.	Dis.
	11	12		I.	Oc	Re.
28	5	34		I.	Sh.	In.
	6	5		I.	Tr.	In.
	7	49		I.	Sh.	Eg
	8	20		I.	Tr.	Eg.
	10	59	22.2	II.	Ec.	Dis.
	14	45		II.	Oc.	Re.
	22	47		III.	Sh.	In.
29	0	50		III.	Tr.	In.
	1	30		III.	Sh.	Eg.
	2	54	34.8	I.	Ec.	Dis.
	3	32		III.	Tr.	Eg.
	5	38		I.	Oc.	Re.
30	0	2		I.	Sh.	In.
	0	31		I.	Tr.	In.
	2	17		I.	Sh.	Eg.
	2	46		I.	Tr.	Eg.
	5	58		II.	Sh.	In.
	6	55		II.	Tr.	In.
	8	44		II.	Sh.	Eg.
	9	42		II.	Tr.	Eg.
	21	23	10.2	I.	Ec.	Dis.
31	0	5		I.	Oc.	Re.
	18	30		I.	Sh.	In.
	18	57		I.	Tr.	In.
	20	45		I.	Sh.	Eg.
	21	12		I.	Tr.	Eg

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr. transit of the satellite: Sh.. transit of the shadow;

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s				d	h	m	s				d	h	m	s			
1	0	16	26.2	II.	Ec.	Dis.	11	11	36		I.	Sh.	Eg.	20	16	34		II.	Sh.	Eg.
	3	53		II.	Oc.	Re.		11	48		I.	Tr.	Eg.	21	3	1		I.	Oc.	Dis.
	12	57	59.7	III.	Ec.	Dis.*		16	7	55.0	II.	Ec.	Dis.		5	17	38.1	I.	Ec.	Re.
	15	51	38.7	I.	Ec.	Dis.*		19	15		II.	Oc.	Re.	22	0	8		I.	Tr.	In.
	17	19		III.	Oc.	Re.	12	6	42	58.8	I.	Ec.	Dis.		0	12		I.	Sh.	In.
	18	31		I.	Oc.	Re.		6	43		III.	Sh.	In.		2	24		I.	Tr.	Eg.
2	12	59		I.	Sh.	In.*		7	26		III.	Tr.	In.		2	28		I.	Sh.	Eg.
	13	23		I.	Tr.	In.*		9	7		I.	Oc.	Re.*		7	49		II.	Oc.	Dis.
	15	14		I.	Sh.	Eg.*		9	28		III.	Sh.	Eg.*		10	42	33.7	II.	Ec.	Re.*
	15	38		I.	Tr.	Eg *		10	8		III.	Tr.	Eg.*		21	27		I.	Oc.	Dis.
	19	16		II.	Sh.	In.	13	3	50		I.	Sh.	In.		23	46	11.9	I.	Ec.	Re.
	20	4		II.	Tr.	In.		3	59		I.	Tr.	In.	23	0	28		III.	Oc.	Dis.
	22	2		II.	Sh.	Eg.		6	4		I.	Sh.	Eg.		3	29	40.2	III.	Ec.	Re.
	22	50		II.	Tr.	Eg.		6	14		I.	Tr.	Eg.		18	34		I.	Tr.	In.
3	10	20	13.2	I.	Ec.	Dis *		11	10		II.	Sh.	In.*		18	40		I.	Sh.	In.
	12	57		I.	Oc.	Re.*		11	28		II.	Tr.	In.*		20	50		I.	Tr.	Eg.
4	7	27		I.	Sh.	In.		13	58		II.	Sh.	Eg.*		20	57		I.	Sh.	Eg
	7	49		I.	Tr.	In.		14	14		II.	Tr.	Eg *	24	2	50		II.	Tr.	In.
	9	42		I.	Sh.	Eg.	14	1	11	36.8	I.	Ec.	Dis.		3	4		II.	Sh.	In.
	10	4		I.	Tr.	Eg.*		3	33		I.	Oc.	Re.		5	38		II.	Tr.	Eg.
	13	33	31.3	II.	Ec.	Dis.*		22	18		I.	Sh.	In.		5	52		II.	Sh.	Eg.
	17	0		II.	Oc.	Re.		22	25		I.	Tr.	In.		15	53		I.	Oc.	Dis.*
5	2	45		III.	Sh.	In.	15	0	33		I.	Sh.	Eg.		18	14	51.2	I.	Ec.	Re.
	4	9		III.	Tr.	In.		0	40		I.	Tr.	Eg.	25	13	0		I.	Tr.	In.*
	4	48	43.8	I.	Ec.	Dis.		5	25	16.1	II.	Ec.	Dis.		13	9		I.	Sh.	In.*
	5	29		III.	Sh.	Eg.		18	22		II.	Oc.	Re.		15	16		I.	Tr.	Eg.*
	6	51		III.	Tr.	Eg.		19	40	8.3	I.	Ec.	Dis.		15	25		I.	Sh	Eg.*
	7	23		I.	Oc.	Re.		20	55	9.5	III.	Ec.	Dis.		20	56		II.	Oc.	Dis.
6	1	56		I.	Sh.	In.		21	59		I.	Oc	Re.	26	0	0	8.3	II.	Ec.	Re.
	2	15		I.	Tr.	In.		23	54		III.	Oc.	Re.		10	19		I.	Oc.	Dis.*
	4	10		I.	Sh.	Eg.	16	16	47		I.	Sh.	In.		12	43	26.8	I.	Ec.	Re.*
	4	30		I.	Tr.	Eg.		16	50		I.	Tr.	In.		13	59		III.	Tr.	In.*
	8	34		II.	Sh.	In.		19	2		I.	Sh.	Eg.		14	41		III.	Sh.	In.*
	9	12		II.	Tr.	In.*		19	6		I.	Tr.	Eg.		16	42		III.	Tr.	Eg.
	11	21		II.	Sh.	Eg.*	17	0	28		II.	Sh.	In.		17	28		III.	Sh.	Eg.
	11	58		II.	Tr.	Eg.*		0	36		II.	Tr.	In.	27	7	26		I.	Tr.	In.
	23	17	20.7	I.	Ec.	Dis.		3	16		II.	Sh.	Eg.		7	38		I.	Sh.	In.
7	1	49		I.	Oc.	Re.		3	22		II.	Tr.	Eg.		9	42		I.	Tr.	Eg.*
	20	24		I.	Sh.	In.		14	8	45.6	I.	Ec.	Dis.*		9	54		I.	Sh.	Eg.*
	20	41		I.	Tr.	In.		16	25		I.	Oc.	Re.		15	58		II.	Tr.	In.
	22	39		I.	Sh.	Eg.	18	11	15		I.	Sh.	In.*		16	22		II.	Sh.	In.
	22	56		I.	Tr.	Eg.		11	16		I.	Tr.	In.*		18	45		II.	Tr.	Eg
8	2	50	43.6	II.	Ec.	Dis.		13	31		I.	Sh.	Eg.*		19	10		II.	Sh.	Eg.
	6	7		II.	Oc.	Re.		13	32		I.	Tr.	Eg.*	28	4	45		I.	Oc.	Dis.
	16	56	27.1	III.	Ec.	Dis.		18	42		II.	Oc.	Dis.		7	12	8.3	I.	Ec.	Re.
	17	45	50.5	I.	Ec.	Dis.		21	29		II.	Oc.	Re.	29	1	52		I.	Tr.	In.
	20	15		I.	Oc.	Re.	19	8	35		I.	Oc.	Dis.*		2	6		I.	Sh.	In.
	20	37		III.	Oc.	Re.		10	42		III.	Sh.	In.*		4	8		I.	Tr.	Eg.
9	14	53		I.	Sh.	In.*		10	42		III.	Tr.	In.*		4	22		I.	Sh.	Eg.
	15	7		I.	Tr.	In.*		10	51		I.	Oc.	Re.*		10	3		II.	Oc.	Dis.*
	17	8		I.	Sh.	Eg.		13	25		III.	Tr.	Eg.*		13	17	59.0	II.	Ec.	Re.*
	17	22		I.	Tr.	Eg.		13	28		III.	Sh.	Eg.*		23	11		I.	Oc.	Dis.
	21	52		II.	Sh.	In.	20	5	42		I.	Tr.	In.	30	1	40	43.6	I.	Ec.	Re.
	22	20		II.	Tr.	In.		5	44		I.	Sh.	In.		3	44		III.	Oc.	Dis.
10	0	40		II.	Sh.	Eg.		7	58		I.	Tr.	Eg.		7	29	14.6	III.	Ec.	Re.
	1	6		II.	Tr.	Eg.		8	0		I.	Sh.	Eg.		20	18		I.	Tr.	In.
	12	14	26.7	I.	Ec.	Dis *		13	43		II.	Tr.	In.*		20	35		I.	Sh.	In.
	14	41		I.	Oc.	Re.*		13	46		II.	Sh.	In.*		22	34		I.	Tr.	Eg.
11	9	21		I.	Sh.	In.		16	30		II.	Tr.	Eg		22	51		I.	Sh.	Eg.
	9	33		I.	Tr.	In.														

In., denotes ingress; Eg., egress: Dis., disappearance; Re., reappearance. *Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

d	h	m	s			
1	5	6		II.	Tr.	In.
	5	40		II.	Sh.	In.
	7	53		II.	Tr.	Eg.
	8	28		II.	Sh.	Eg.*
	17	37		I.	Oc.	Dis.
	20	9	24.2	I.	Ec.	Re.
2	14	44		I.	Tr.	In.*
	15	4		I.	Sh.	In.
	17	0		I.	Tr.	Eg.
	17	20		I.	Sh.	Eg.
	23	10		II.	Oc.	Dis.
3	2	35	40.2	II.	Ec.	Re.
	12	3		I.	Oc.	Dis.*
	14	38	1.1	I.	Ec.	Re.*
	17	17		III.	Tr.	In.
	18	40		III.	Sh.	In.
	20	0		III.	Tr.	Eg.
	21	28		III.	Sh.	Eg.
4	9	10		I.	Tr.	In.*
	9	32		I.	Sh.	In.*
	11	26		I.	Tr.	Eg.*
	11	48		I.	Sh.	Eg.*
	18	14		II.	Tr.	In.
	18	58		II.	Sh.	In.
	21	1		II.	Tr.	Eg.
	21	46		II.	Sh.	Eg.
5	6	30		I.	Oc.	Dis.
	9	6	44.0	I.	Ec.	Re.*
6	3	36		I.	Tr.	In.
	4	0		I.	Sh.	In.
	5	52		I.	Tr.	Eg.
	6	17		I.	Sh.	Eg.
	12	18		II.	Oc.	Dis.*
	15	53	40.7	II.	Ec.	Re.
7	0	56		I.	Oc.	Dis.
	3	35	20.7	I.	Ec.	Re.
	7	2		III.	Oc.	Dis.
	11	29	13.3	III.	Ec.	Re.*
	22	2		I.	Tr.	In.
	22	29		I.	Sh.	In.
8	0	18		I.	Tr.	Eg.
	0	45		I.	Sh.	Eg.
	7	22		II.	Tr.	In.
	8	16		II.	Sh.	In.*
	10	9		II.	Tr.	Eg.*
	11	4		II.	Sh.	Eg.*
	19	22		I.	Oc.	Dis.
	22	4	2.3	I.	Ec.	Re.
9	16	28		I.	Tr.	In.
	16	58		I.	Sh.	In.
	18	44		I.	Tr.	Eg.
	19	14		I.	Sh.	Eg.
10	1	26		II.	Oc.	Dis.
	5	11	27.8	II.	Ec.	Re.
	13	49		I.	Oc.	Dis.*
	16	32	40.7	I.	Ec.	Re.
	20	37		III.	Tr.	In.
	22	39		III.	Sh.	In.
	23	20		III.	Tr.	Eg.
11	1	29		III.	Sh.	Eg.
	10	55		I.	Tr.	In.*
	11	27		I.	Sh.	In.*

d	h	m	s			
11	13	11		I.	Tr.	Eg.*
	13	43		I.	Sh.	Eg.*
	20	30		II.	Tr.	In.
	21	34		II.	Sh.	In.
	23	17		II.	Tr.	Eg.
12	0	22		II.	Sh.	Eg.
	8	15		I.	Oc.	Dis.*
	11	1	24.7	I.	Ec.	Re.*
13	5	21		I.	Tr.	In.
	5	56		I.	Sh.	In.
	7	37		I.	Tr.	Eg.
	8	12		I.	Sh.	Eg.*
	14	35		II.	Oc.	Dis.
	18	29	38.3	II.	Ec.	Re.
14	2	41		I.	Oc.	Dis.
	5	30	2.8	I.	Ec.	Re.
	10	23		III.	Oc.	Dis *
	15	29	21.2	III.	Ec.	Re.
	23	48		I.	Tr.	In.
15	0	24		I.	Sh.	In.
	2	4		I.	Tr.	Eg.
	2	40		I.	Sh.	Eg.
	9	39		II.	Tr.	In.*
	10	52		II.	Sh.	In.*
	12	26		II.	Tr.	Eg *
	13	40		II.	Sh.	Eg.*
	21	7		I.	Oc.	Dis.
	23	58	45.4	I.	Ec.	Re.
16	18	14		I.	Tr.	In.
	18	53		I.	Sh.	In.
	20	30		I.	Tr.	Eg.
	21	9		I.	Sh.	Eg.
17	3	44		II.	Oc.	Dis.
	7	47	31.5	II.	Ec.	Re.
	15	34		I.	Oc	Dis.
	18	27	25.1	I.	Ec.	Re.
	23	58		III.	Tr.	In.
18	2	38		III.	Sh.	In.
	2	43		III.	Tr.	Eg.
	5	28		III.	Sh.	Eg.
	12	41		I.	Tr.	In.*
	13	22		I.	Sh.	In.*
	14	57		I.	Tr.	Eg.
	15	37		I.	Sh.	Eg
	22	48		II.	Tr.	In.
19	0	10		II.	Sh.	In.
	1	35		II.	Tr.	Eg.
	2	59		II.	Sh.	Eg.
	10	0		I.	Oc.	Dis.*
	12	56	9.2	I.	Ec.	Re.*
20	7	7		I.	Tr.	In.
	7	50		I.	Sh.	In.
	9	23		I.	Tr.	Eg.*
	10	6		I.	Sh.	Eg.*
	16	53		II.	Oc.	Dis.
	21	5	51.6	II.	Ec.	Re.
21	4	27		I.	Oc.	Dis.
	7	24	49.6	I.	Ec.	Re.
	13	47		III.	Oc.	Dis.
	16	32		III.	Oc.	Re.
	16	49	30.4	III.	Ec.	Dis.
	19	30	13.0	III.	Ec.	Re.

d	h	m	s			
22	1	34		I.	Tr.	In.
	2	19		I.	Sh.	In.
	3	50		I.	Tr.	Eg.
	4	35		I.	Sh.	Eg.
	11	57		II.	Tr.	In.
	13	28		II.	Sh.	In.*
	14	44		II.	Tr.	Eg.
	16	17		II.	Sh.	Eg
	23	53		I.	Oc.	Dis.
23	1	53	33.2	I.	Ec.	Re.
	20	0		I.	Tr.	In.
	20	48		I.	Sh.	In.
	22	16		I.	Tr.	Eg.
	23	3		I.	Sh.	Eg.
24	6	2		II.	Oc.	Dis.
	10	23	50.3	II.	Ec.	Re.*
	17	20		I.	Oc.	Dis.
	20	22	14.0	I.	Ec.	Re.
25	3	24		III.	Tr.	In.
	6	9		III.	Tr.	Eg
	6	37		III.	Sh.	In.
	9	29		III.	Sh	Eg.*
	14	27		I.	Tr.	In.
	15	16		I.	Sh.	In.
	16	43		I.	Tr.	Eg.
	17	32		I.	Sh.	Eg.
26	1	7		II.	Tr.	In.
	2	46		II.	Sh.	In.
	3	54		II.	Tr.	Eg.
	5	35		II.	Sh.	Eg
	11	47		I.	Oc	Dis.*
	14	51	0.0	I.	Ec.	Re.
27	8	54		I.	Tr.	In.*
	9	45		I.	Sh.	In.*
	11	10		I.	Tr.	Eg.*
	12	1		I.	Sh.	Eg.*
	19	13		II.	Oc.	Dis.
	23	42	20.0	II.	Ec.	Re.
28	6	14		I.	Oc.	Dis.
	9	19	40.5	I.	Ec.	Re.*
	17	14		III.	Oc.	Dis.
	20	0		III.	Oc	Re.
	20	48	46.3	III.	Ec.	Dis.
	23	30	36.7	III.	Ec.	Re.
29	3	21		I.	Tr.	In.
	4	14		I.	Sh.	In.
	5	37		I.	Tr.	Eg.
	6	30		I.	Sh.	Eg.
	14	17		II.	Tr.	In.
	16	4		II.	Sh.	In.
	17	4		II.	Tr.	Eg.
	18	53		II.	Sh.	Eg.
30	0	41		I.	Oc.	Dis.
	3	48	24.8	I.	Ec.	Re.
	21	48		I.	Tr.	In.
	22	42		I.	Sh.	In.
31	0	4		I.	Tr.	Eg.
	0	59		I.	Sh.	Eg.
	8	23		II.	Oc.	Dis.*
	13	0	23.9	II.	Ec.	Re.
	19	8		I.	Oc.	Dis.
	22	17	6.4	I.	Ec.	Re.

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
1	6	53		III.	Tr.	In.
	9	39		III.	Tr.	Eg.*
	10	36		III.	Sh.	In.*
	13	29		III.	Sh.	Eg.
	16	15		I.	Tr.	In.
	17	11		I.	Sh.	In.
	18	31		I.	Tr.	Eg.
	19	28		I.	Sh.	Eg.
2	3	28		II.	Tr.	In.
	5	22		II.	Sh.	In.
	6	15		II.	Tr.	Eg.
	8	11		II.	Sh.	Eg.*
	13	35		I.	Oc	Dis.
	16	45	53.1	I.	Ec.	Re.
3	10	42		I.	Tr.	In.*
	11	40		I.	Sh.	In.*
	12	58		I.	Tr.	Eg.
	13	56		I.	Sh.	Eg.
	14	50		IV.	Sh.	In.
	15	26		IV.	Sh.	Eg.
	21	35		II.	Oc.	Dis.
4	2	19	3.1	II.	Ec.	Re.
	8	2		I.	Oc.	Dis.*
	11	14	34.7	I.	Ec.	Re.*
	20	45		III.	Oc.	Dis.
	23	32		III.	Oc.	Re.
5	0	48	13.7	III.	Ec.	Dis.
	3	31	11.5	III.	Ec.	Re.
	5	9		I.	Tr.	In.
	6	8		I.	Sh.	In.
	7	25		I.	Tr.	Eg.
	8	25		I.	Sh.	Eg.*
	16	39		II.	Tr.	In.
	18	40		II.	Sh.	In.
	19	27		II.	Tr.	Eg.
	21	29		II.	Sh.	Eg.
6	2	29		I.	Oc.	Dis.
	5	43	19.7	I.	Ec.	Re.
	23	36		I.	Tr.	In.
7	0	37		I.	Sh.	In.
	1	52		I.	Tr.	Eg.
	2	54		I.	Sh.	Eg.
	10	46		II.	Oc	Dis.*
	15	37	12.0	II.	Ec.	Re.
	20	56		I.	Oc.	Dis.
8	0	12	2.3	I.	Ec.	Re.
	10	26		III.	Tr.	In.*
	13	13		III.	Tr.	Eg.
	14	36		III.	Sh.	In.
	17	30		III.	Sh.	Eg.
	18	3		I.	Tr.	In.
	19	6		I.	Sh.	In.
	20	19		I.	Tr.	Eg.
	21	22		I.	Sh.	Eg.
9	5	51		II.	Tr.	In.
	7	58		II.	Sh.	In.*
	8	39		II.	Tr.	Eg.*
	10	47		II.	Sh.	Eg.*
	15	23		I.	Oc.	Dis.
	18	40	49.5	I.	Ec.	Re.
10	12	30		I.	Tr.	In.
	13	35		I.	Sh.	In.
	14	46		I.	Tr.	Eg.
	15	51		I.	Sh.	Eg.
	23	59		II.	Oc.	Dis.
11	4	55	59.8	II.	Ec.	Re.
	9	50		I.	Oc.	Dis.*
	13	9	33.2	I.	Ec.	Re.
	23	38	47.9	IV.	Ec.	Dis.
12	0	20		III.	Oc.	Dis.
	0	34	11.5	IV.	Ec.	Re.
	3	8		III.	Oc.	Re.
	4	47	18.9	III.	Ec.	Dis
	6	58		I.	Tr.	In.
	7	31	23.9	III.	Ec.	Re.*
	8	4		I.	Sh.	In.*
	9	14		I.	Tr.	Eg.*
	10	20		I.	Sh.	Eg *
	19	3		II.	Tr.	In.
	21	16		II.	Sh.	In.
	21	51		II.	Tr.	Eg.
13	0	5		II.	Sh.	Eg.
	4	18		I.	Oc.	Dis.
	7	38	17.6	I.	Ec.	Re.*
14	1	25		I.	Tr.	In.
	2	33		I.	Sh.	In.
	3	41		I.	Tr.	Eg.
	4	49		I.	Sh.	Eg.
	13	12		II.	Oc.	Dis.
	18	14	13.0	II.	Ec.	Re.
	22	45		I.	Oc	Dis.
15	2	7	0.9	I.	Ec.	Re.
	14	5		III.	Tr.	In.
	16	52		III.	Tr.	Eg.
	18	36		III.	Sh.	In.
	19	52		I.	Tr.	In.
	21	1		I.	Sh.	In.
	21	31		III.	Sh.	Eg.
	22	9		I.	Tr.	Eg.
	23	17		I.	Sh.	Eg
16	8	16		II.	Tr.	In.*
	10	34		II.	Sh.	In.*
	11	4		II.	Tr.	Eg.*
	13	23		II.	Sh.	Eg.
	17	13		I.	Oc.	Dis.
	20	35	48.7	I.	Ec.	Re.
17	14	20		I.	Tr.	In.
	15	30		I.	Sh.	In.
	16	37		I.	Tr.	Eg.
	17	46		I.	Sh.	Eg.
18	2	26		II.	Oc.	Dis.
	7	33	9.0	II.	Ec.	Re.*
	11	41		I.	Oc.	Dis.
	15	4	32.0	I.	Ec.	Re.
19	4	0		III.	Oc.	Dis.
	6	48		III.	Oc.	Re.
	8	46	25.4	III.	Ec.	Dis.*
	8	48		I.	Tr.	In.*
	9	58		I.	Sh.	In.*
	11	5		I.	Tr.	Eg.*
19	11	31	37.4	III.	Ec.	Re.*
	12	15		I.	Sh.	Eg
	21	29		II.	Tr.	In.
	23	52		II.	Sh.	In.
20	0	17		II.	Tr.	Eg.
	2	41		II.	Sh.	Eg.
	6	8		I.	Oc.	Dis.
	8	39		IV.	Sh.	In.*
	9	33	17.7	I.	Ec.	Re.*
	9	51		IV.	Sh.	Eg.*
21	3	16		I.	Tr.	In.
	4	27		I.	Sh.	In.
	5	33		I.	Tr.	Eg.
	6	44		I.	Sh.	Eg.
	15	40		II.	Oc.	Dis.
	20	51	26.2	II.	Ec.	Re.
22	0	36		I.	Oc.	Dis.
	4	2	1.5	I.	Ec.	Re.
	17	47		III.	Tr.	In.
	20	36		III.	Tr.	Eg
	21	44		I.	Tr.	In.
	22	36		III.	Sh.	In.
	22	56		I.	Sh.	In.
23	0	1		I.	Tr.	Eg
	1	13		I.	Sh.	Eg.
	1	32		III.	Sh.	Eg.
	10	43		II.	Tr.	In.*
	13	10		II.	Sh	In.
	13	31		II.	Tr.	Eg.
	15	59		II.	Sh.	Eg.
	19	4		I.	Oc.	Dis.
	22	30	49.6	I.	Ec.	Re.
24	16	12		I.	Tr.	In.
	17	25		I.	Sh.	In.
	18	29		I.	Tr.	Eg.
	19	41		I.	Sh.	Eg.
25	4	55		II.	Oc.	Dis.
	10	10	29.8	II.	Ec.	Re.*
	13	32		I.	Oc	Dis.
	16	59	33.6	I.	Ec.	Re.
26	7	45		III.	Oc.	Dis.*
	10	34		III.	Oc.	Re.*
	10	40		I.	Tr.	In.*
	11	54		I.	Sh.	In.
	12	45	54.0	III.	Ec.	Dis.
	12	57		I.	Tr.	Eg.
	14	10		I.	Sh.	Eg.
	15	32	12.6	III.	Ec.	Re.
	23	57		II.	Tr.	In.
27	2	28		II.	Sh.	In.
	2	45		II.	Tr.	Eg.
	5	17		II.	Sh.	Eg.
	8	0		I.	Oc.	Dis *
	11	28	19.5	I.	Ec.	Re.
28	5	8		I.	Tr.	In.
	6	23		I.	Sh.	In.
	7	25		I.	Tr.	Eg.*
	8	39		I.	Sh.	Eg.*
	17	30	14.9	IV.	Ec.	Dis.
	18	10		II.	Oc	Dis.

In., denotes ingress; Eg., egress: Dis., disappearance; Re., reappearance. *Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
28	18	52	15.9	IV.	Ec.	Re.
	23	28	50.3	II.	Ec.	Re.
29	2	28		I.	Oc.	Dis.
	5	57	3.5	I.	Ec.	Re.
	21	34		III.	Tr.	In.
	23	36		I.	Tr.	In.
30	0	24		III.	Tr.	Eg.
	0	52		I.	Sh.	In.
30	1	53		I.	Tr.	Eg.
	2	36		III.	Sh.	In.
	3	8		I.	Sh.	Eg.
	5	33		III.	Sh.	Eg.
	13	12		II.	Tr.	In.
	15	45		II.	Sh.	In.
	16	0		II.	Tr.	Eg.
30	18	35		II.	Sh.	Eg.
	20	56		I.	Oc.	Dis.
31	0	25	51.6	I.	Ec.	Re.
	18	4		I.	Tr.	In.
	19	21		I.	Sh.	In.
	20	21		I.	Tr.	Eg.
	21	37		I.	Sh.	Eg.

SEPTEMBER.

d	h	m	s			
1	7	26		II.	Oc.	Dis.*
	12	48	0.9	II.	Ec.	Re.
	15	24		I.	Oc.	Dis.
	18	54	35.8	I.	Ec.	Re.
2	11	34		III.	Oc.	Dis.
	12	33		I.	Tr.	In.
	13	50		I.	Sh.	In.
	14	24		III.	Oc.	Re.
	14	49		I.	Tr.	Eg.
	16	6		I.	Sh.	Eg.
	16	45	26.3	III.	Ec.	Dis.
	19	32	50.9	III.	Ec.	Re.
3	2	28		II.	Tr.	In.
	5	3		II.	Sh.	In.
	5	16		II.	Tr.	Eg.
	7	53		II.	Sh.	Eg.*
	9	52		I.	Oc.	Dis.*
	13	23	21.8	I.	Ec.	Re.
4	7	1		I.	Tr.	In.
	8	19		I.	Sh.	In.*
	9	17		I.	Tr.	Eg.*
	10	35		I.	Sh.	Eg.
	20	42		II.	Oc.	Dis.
5	2	6	24.0	II.	Ec.	Re.
	4	21		I.	Oc.	Dis.
	7	52	6.0	I.	Ec.	Re.*
	15	25		IV.	Tr.	In.
	15	57		IV.	Tr.	Eg.
6	1	26		III.	Tr.	In.
	1	30		I.	Tr.	In.
	2	34		IV.	Sh.	In.
	2	48		I.	Sh.	In.
	3	45		I.	Tr.	Eg.
	4	10		IV.	Sh.	Eg.
	4	17		III.	Tr.	Eg.
	5	4		I.	Sh.	Eg.
	6	36		III.	Sh.	In.
	9	33		III.	Sh.	Eg.*
	15	44		II.	Tr.	In.
	18	20		II.	Sh.	In.
	18	32		II.	Tr.	Eg.
	21	11		II.	Sh.	Eg.
	22	49		I.	Oc.	Dis.
7	2	20	54.0	I.	Ec.	Re.
	19	58		I.	Tr.	In.
	21	16		I.	Sh.	In.
	22	14		I.	Tr.	Eg.
	23	33		I.	Sh.	Eg.
8	10	0		II.	Oc.	Dis.*
	15	24	40.8	II.	Ec.	Re.
	17	18		I.	Oc.	Dis.
	20	49	38.7	I.	Ec.	Re.
9	14	27		I.	Tr.	In.
	15	28		III.	Oc.	Dis.
	15	45		I.	Sh.	In.
	16	43		I.	Tr.	Eg.
	18	2		I.	Sh.	Eg.
	18	19		III.	Oc.	Re.
	20	45	37.6	III.	Ec.	Dis.
	23	34	7.8	III.	Ec.	Re.
10	5	0		II.	Tr.	In.
	7	38		II.	Sh.	In.*
	7	48		II.	Tr.	Eg.*
	10	29		II.	Sh.	Eg.
	11	46		I.	Oc.	Dis.
	15	18	24.5	I.	Ec.	Re.
11	8	56		I.	Tr.	In.*
	10	14		I.	Sh.	In.
	11	12		I.	Tr.	Eg.
	12	31		I.	Sh.	Eg.
	23	18		II.	Oc.	Dis.
12	4	44	6.2	II.	Ec.	Re.
	6	15		I.	Oc.	Dis.
	9	47	8.7	I.	Ec.	Re.*
13	3	25		I.	Tr.	In.
	4	43		I.	Sh.	In.
	5	22		III.	Tr.	In.
	5	41		I.	Tr.	Eg.
	7	0		I.	Sh.	Eg.*
	8	13		III.	Tr.	Eg.*
	10	35		III.	Sh.	In.
	13	34		III.	Sh.	Eg.
	18	17		II.	Tr.	In.
	20	56		II.	Sh.	In.
	21	5		II.	Tr.	Eg.
	23	38		IV.	Oc.	Dis.
	23	46		II.	Sh.	Eg.
14	0	31		IV.	Oc.	Re.
	0	43		I.	Oc.	Dis.
	4	15	56.4	I.	Ec.	Re.
	11	25	2.0	IV.	Ec.	Dis.
	13	7	0.4	IV.	Ec.	Re.
	21	53		I.	Tr.	In.
	23	12		I.	Sh.	In.
15	0	10		I.	Tr.	Eg.
	1	28		I.	Sh.	Eg.
15	12	36		II.	Oc.	Dis.
	18	3	28.3	II.	Ec.	Re.
	19	12		I.	Oc.	Dis.
	22	44	41.1	I.	Ec.	Re.
16	16	22		I.	Tr.	In.
	17	40		I.	Sh.	In.
	18	39		I.	Tr.	Eg.
	19	26		III.	Oc.	Dis.
	19	57		I.	Sh.	Eg.
	22	18		III.	Oc.	Re.
17	0	45	15.3	III.	Ec.	Dis.
	3	34	50.7	III.	Ec.	Re.
	7	35		II.	Tr.	In.*
	10	14		II.	Sh.	In.
	10	23		II.	Tr.	Eg.
	13	4		II.	Sh.	Eg.
	13	41		I.	Oc.	Dis.
	17	13	26.8	I.	Ec.	Re.
18	10	51		I.	Tr.	In.
	12	9		I.	Sh.	In.
	13	8		I.	Tr.	Eg
	14	26		I.	Sh.	Eg.
19	1	55		II.	Oc.	Dis.
	7	21	55.6	II.	Ec.	Re.*
	8	9		I.	Oc.	Dis.*
	11	42	10.7	I.	Ec.	Re.
20	5	20		I.	Tr.	In.
	6	38		I.	Sh.	In.
	7	37		I.	Tr.	Eg.*
	8	55		I.	Sh.	Eg.*
	9	22		III.	Tr.	In.*
	12	15		III.	Tr.	Eg.
	14	35		III.	Sh.	In.
	17	35		III.	Sh.	Eg
	20	53		II.	Tr.	In.
	23	31		II.	Sh.	In.
	23	41		II.	Tr.	Eg.
21	2	22		II.	Sh.	Eg.
	2	38		I.	Oc.	Dis.
	6	10	58.2	I.	Ec.	Re.
	23	49		I.	Tr.	In.
22	1	7		I.	Sh.	In.
	2	6		I.	Tr.	Eg
	3	24		I.	Sh.	Eg.
	8	53		IV.	Tr.	In.*
	10	0		IV.	Tr.	Eg.
	15	15		II.	Oc	Dis.
	20	33		IV.	Sh.	In.

NOTE.—For Phases of Eclipses see pages 462 and 463 * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
22	20	41	22.2	II.	Ec.	Re.	25	12	47		I.	Tr.	In.	28	2	19		II.	Tr.	Eg.
	21	7		I.	Oc.	Dis.		14	5		I.	Sh.	In.		4	34		I.	Oc.	Dis.
	22	27		II.	Sh.	Eg.		15	4		I.	Tr.	Eg.		4	57		II.	Sh.	Eg.
23	0	39	42.8	I.	Ec.	Re.		16	21		I.	Sh.	Eg.		8	5	58.7	I.	Ec.	Re.*
	18	18		I.	Tr.	In.	26	4	34		II.	Oc.	Dis	29	1	45		I.	Tr.	In.
	19	36		I.	Sh.	In.		9	59	50.7	II.	Ec.	Re.		3	2		I.	Sh.	In.
	20	35		I.	Tr.	Eg.		10	5		I.	Oc.	Dis.		4	2		I.	Tr.	Eg.
	21	53		I.	Sh.	Eg.		13	37	11.8	I.	Ec.	Re.		5	19		I.	Sh.	Eg.
	23	28		III.	Oc.	Dis.	27	7	16		I.	Tr.	In.*		17	55		II.	Oc.	Dis.
24	2	22		III.	Oc.	Re.		8	33		I.	Sh.	In.*		23	4		I.	Oc.	Dis.
	4	44	57.9	III.	Ec.	Dis.		9	33		I.	Tr.	Eg.		23	19	20.9	II.	Ec.	Re.
	7	35	38.1	III.	Ec.	Re.*		10	50		I.	Sh	Eg.	30	2	34	43.2	I.	Ec.	Re.
	10	11		II.	Tr.	In.		13	26		III.	Tr.	In.		17	47		IV.	Oc.	Dis.
	12	49		II.	Sh.	In.		16	20		III.	Tr.	Eg.		19	7		IV.	Oc.	Re.
	13	0		II.	Tr.	Eg.		18	35		III.	Sh.	In.		20	14		I.	Tr.	In.
	15	36		I.	Oc.	Dis.		21	36		III.	Sh.	Eg.		21	31		I.	Sh.	In.
	15	40		II.	Sh.	Eg.		23	30		II.	Tr.	In.		22	32		I.	Tr.	Eg.
	19	8	27.9	I.	Ec.	Re.	28	2	6		II.	Sh.	In.		23	48		I.	Sh.	Eg.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	3	34		III.	Oc.	Dis.	6	20	37		II.	Oc.	Dis.	12	5	39		III.	Sh.	Eg.
	5	21	57.1	IV.	Ec.	Dis.	7	1	1		I.	Oc.	Dis.		7	16		II.	Sh.	In.*
	6	28		III.	Oc.	Re.		1	57	22.7	II.	Ec.	Re.		7	38		II.	Tr.	Eg.*
	7	20	17.7	IV.	Ec.	Re.*		4	29	42.1	I.	Ec.	Re.		8	29		I.	Oc.	Dis.
	8	44	15.1	III.	Ec.	Dis.*		22	13		I.	Tr.	In.		10	7		II.	Sh.	Eg.
	11	35	59.5	III.	Ec.	Re.		23	26		I.	Sh.	In.		11	55	54.8	I.	Ec.	Re.
	12	49		II.	Tr.	In.	8	0	30		I.	Tr.	Eg.	13	5	42		I.	Tr.	In.
	15	24		II.	Sh.	In.		1	44		I.	Sh.	Eg.		6	53		I.	Sh.	In.*
	15	38		II.	Tr.	Eg.		7	42		III.	Oc.	Dis.*		7	58		I.	Tr.	Eg.*
	17	33		I.	Oc.	Dis.		10	38		III.	Oc.	Re.		9	11		I.	Sh.	Eg.
	18	15		II.	Sh.	Eg.		12	43	30.2	III.	Ec.	Dis.		23	21		II.	Oc	Dis.
	21	3	27.8	I.	Ec.	Re.		15	29		II.	Tr.	In.	14	2	59		I.	Oc.	Dis.
2	14	44		I.	Tr.	In.		15	36	18.2	III.	Ec.	Re.		4	35	26.4	II.	Ec.	Re.
	16	0		I.	Sh.	In.		17	59		II.	Sh.	In.		6	24	38.8	I.	Ec.	Re.
	17	1		I.	Tr.	Eg.		18	18		II.	Tr.	Eg.	15	0	12		I.	Tr.	In.
	18	17		I.	Sh.	Eg.		19	30		I.	Oc.	Dis.		1	22		I.	Sh.	In.
3	7	15		II.	Oc.	Dis.*		20	50		II.	Sh.	Eg.		2	28		I.	Tr.	Eg.
	12	2		I.	Oc.	Dis.		22	58	26.2	I.	Ec.	Re.		3	40		I.	Sh.	Eg.
	12	37	49.9	II.	Ec.	Re.	9	3	28		IV.	Tr.	In.		11	55		III.	Oc.	Dis.
	15	32	11.5	I.	Ec.	Re.		5	0		IV.	Tr.	Eg.		14	52		III.	Oc.	Re.
4	9	14		I.	Tr.	In.		14	32		IV.	Sh.	In.		16	43	4.6	III.	Ec.	Dis.
	10	29		I.	Sh.	In.		16	41		IV.	Sh.	Eg.		18	10		II.	Tr.	In.
	11	31		I.	Tr.	Eg.		16	42		I.	Tr.	In.		19	36	55.6	III.	Ec.	Re.
	12	46		I.	Sh.	Eg.		17	55		I.	Sh.	In.		20	34		II.	Sh.	In.
	17	35		III.	Tr.	In.		18	59		I.	Tr.	Eg.		20	59		II.	Tr.	Eg.
	20	30		III.	Tr.	Eg.		20	13		I.	Sh.	Eg.		21	28		I.	Oc.	Dis.
	22	36		III.	Sh.	In.	10	9	58		II.	Oc.	Dis.		23	25		II.	Sh.	Eg.
5	1	38		III.	Sh.	Eg.		14	0		I.	Oc.	Dis.	16	0	53	22.2	I.	Ec.	Re.
	2	9		II.	Tr.	In.		15	15	52.2	II.	Ec.	Re.		18	42		I.	Tr.	In.
	4	41		II.	Sh.	In.		17	27	9.4	I.	Ec.	Re.		19	51		I.	Sh.	In.
	4	58		II.	Tr.	Eg.	11	11	12		I.	Tr.	In.		20	58		I.	Tr.	Eg.
	6	31		I.	Oc.	Dis.*		12	24		I.	Sh.	In.		22	8		I.	Sh.	Eg.
	7	32		II.	Sh.	Eg.*		13	29		I.	Tr.	Eg.	17	12	43		II.	Oc.	Dis.
	10	0	57.7	I.	Ec.	Re.		14	42		I.	Sh.	Eg.		12	43		IV.	Oc.	Dis.
6	3	43		I.	Tr.	In.		21	46		III.	Tr.	In.		14	26		IV.	Oc.	Re.
	4	58		I.	Sh.	In.	12	0	43		III.	Tr.	Eg.		15	58		I.	Oc.	Dis.
	6	0		I.	Tr.	Eg.		2	37		III.	Sh.	In.		17	53	55.5	II.	Ec.	Re.
	7	15		I.	Sh.	Eg.*		4	49		II.	Tr.	In		19	22	4.9	I.	Ec.	Re.

In., denotes ingress; Eg., egress: Dis., disappearance; Re., reappearance. * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
17	23	19	53.8	IV.	Ec.	Dis.	22	23	9		II.	Sh.	In.	26	15	45	41.3	I.	Ec.	Re.
18	1	33	8.6	IV.	Ec.	Re.		23	27		I.	Oc.	Dis.	27	9	41		I.	Tr.	In.
	13	12		I.	Tr.	In.		23	37	31.3	III.	Ec.	Re.		10	45		I.	Sh.	In.
	14	20		I.	Sh.	In.		23	42		II.	Tr.	Eg.		11	58		I.	Tr.	Eg.
	15	28		I.	Tr.	Eg.	23	2	0		II.	Sh.	Eg.		13	2		I.	Sh.	Eg
	16	37		I.	Sh.	Eg		2	48	15.7	I.	Ec.	Re.	28	4	53		II.	Oc.	Dis.
19	2	1		III.	Tr.	In.		20	41		I.	Tr.	In.		6	56		I.	Oc.	Dis.
	4	58		III.	Tr.	Eg.		21	47		I.	Sh.	In.		9	51	33.7	II.	Ec.	Re.
	6	37		III.	Sh.	In.*		22	58		I.	Tr.	Eg.		10	14	24.4	I.	Ec.	Re.
	7	31		II.	Tr.	In.*	24	0	4		I.	Sh.	Eg.	29	4	11		I.	Tr.	In.
	9	40		III.	Sh.	Eg.		15	29		II.	Oc.	Dis.		5	14		I.	Sh.	In.
	9	51		II.	Sh.	In.		17	57		I.	Oc.	Dis.		6	28		I.	Tr.	Eg *
	10	20		II.	Tr.	Eg.		20	31	58.9	II.	Ec.	Re.		7	30		I.	Sh	Eg.
	10	28		I.	Oc.	Dis.		21	16	57.6	I.	Ec.	Re.		20	28		III.	Oc.	Dis
	12	42		II.	Sh.	Eg.	25	15	11		I.	Tr.	In.		23	28		III.	Oc.	Re.
	13	50	49.5	I.	Ec.	Re.		16	16		I.	Sh.	In.		23	36		II.	Tr.	In.
20	7	41		I.	Tr.	In.*		17	28		I.	Tr.	Eg.	30	0	42	45.2	III.	Ec.	Dis.
	8	49		I.	Sh.	In.		18	33		I.	Sh.	Eg		1	26		I.	Oc.	Dis.
	9	58		I.	Tr.	Eg.		22	46		IV.	Tr.	In.		1	44		II.	Sh.	In.
	11	6		I.	Sh.	Eg.	26	0	39		IV.	Tr.	Eg.		2	26		II.	Tr.	Eg.
21	2	6		II.	Oc.	Dis.		6	19		III.	Tr.	In.*		3	38	41.6	III.	Ec.	Re.
	4	57		I.	Oc.	Dis.		8	33		IV.	Sh.	In.		4	35		II.	Sh.	Eg.
	7	13	30.5	II.	Ec.	Re.*		9	18		III.	Tr.	Eg.		4	43	6.0	I.	Ec.	Re.
	8	19	33.0	I.	Ec.	Re.		10	14		II.	Tr.	In.		22	41		I.	Tr.	In.
22	2	11		I.	Tr.	In.		10	36		III.	Sh.	In.		23	43		I.	Sh.	In.
	3	18		I.	Sh.	In.		10	57		IV.	Sh.	Eg.	31	0	58		I.	Tr.	Eg.
	4	28		I.	Tr.	Eg.		12	26		I.	Oc.	Dis.		1	59		I.	Sh.	Eg.
	5	35		I.	Sh.	Eg.		12	26		II.	Sh.	In.		18	16		II.	Oc.	Dis.
	16	10		III.	Oc	Dis.		13	4		II.	Tr.	Eg.		19	56		I.	Oc.	Dis.
	19	8		III.	Oc.	Re.		13	41		III.	Sh.	Eg.		23	10	0.9	II.	Ec.	Re.
	20	42	37.5	III.	Ec.	Dis.		15	17		II.	Sh.	Eg.		23	11	47.6	I.	Ec.	Re.
	20	52		II.	Tr.	In.														

NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	17	11		I.	Tr.	In.	4	12	29	34.8	II	Ec.	Re.	8	21	29		I.	Tr.	Eg.
	18	12		I.	Sh.	In.	5	6	11		I.	Tr.	In.*		23	23		I.	Sh.	Eg.
	19	28		I.	Tr.	Eg.		7	9		I.	Sh.	In.	9	15	0		III.	Tr.	In.
	20	28		I.	Sh.	Eg.		8	28		I.	Tr.	Eg.		15	45		II.	Tr.	In.
2	10	37		III.	Tr.	In.		9	26		I.	Sh.	Eg.		16	26		I.	Oc.	Dis
	12	59		II.	Tr.	In.	6	0	49		III.	Oc.	Dis.		17	35		II.	Sh.	In.
	13	37		III.	Tr.	Eg.		2	22		II.	Tr.	In.		18	1		III.	Tr.	Eg.
	14	26		I.	Oc.	Dis.		3	26		I.	Oc.	Dis.		18	35		II.	Tr.	Eg.
	14	36		III.	Sh.	In.		3	50		III.	Oc.	Ro.		18	36		III.	Sh.	In.
	15	1		II.	Sh.	In.		4	18		II.	Sh.	In.		19	35	16.6	I.	Ec.	Re.
	15	49		II.	Tr.	Eg.		4	42	15.4	III.	Ec.	Dis.		20	27		II.	Sh.	Eg.
	17	40	30.4	I.	Ec.	Re.		5	12		II.	Tr.	Eg.		21	43		III.	Sh.	Eg.
	17	42		III.	Sh.	Eg.		6	37	53.9	I.	Ec.	Re.*	10	13	42		I.	Tr.	In.
	17	52		II.	Sh.	Eg.		7	10		II.	Sh.	Eg.		14	35		I.	Sh.	In.
3	8	17		IV.	Oc.	Dis.		7	39	13.6	III.	Ec.	Re.		15	59		I.	Tr.	Eg.
	10	20		IV.	Oc.	Re.	7	0	41		I.	Tr.	In.		16	52		I.	Sh.	Eg.
	11	41		I.	Tr.	In.		1	38		I.	Sh.	In.	11	10	30		II.	Oc.	Dis.
	12	40		I.	Sh.	In.		2	59		I.	Tr.	Eg.		10	56		I.	Oc.	Dis.
	13	58		I.	Tr.	Eg.		3	54		I.	Sh.	Eg.		14	3	58.3	I.	Ec.	Re.
	14	57		I.	Sh.	Eg.		21	4		II.	Oc.	Dis.		15	7	31.6	II.	Ec.	Re.
	17	18	31.3	IV.	Ec.	Dis.		21	56		I.	Oc	Dis.		18	38		IV.	Tr.	In.
	19	44	45.5	IV.	Ec.	Re.	8	1	6	34.7	I.	Ec.	Re.		20	50		IV.	Tr.	Eg.
4	7	41		II.	Oc.	Dis.		1	48	0.1	II.	Ec.	Re.	12	2	34		IV.	Sh.	In.
	8	56		I.	Oc.	Dis.		19	12		I.	Tr.	In.		5	11		IV.	Sh.	Eg.
	12	9	13.0	I.	Ec.	Re.		20	7		I.	Sh.	In.		8	12		I.	Tr.	In.

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
12	9	4		I.	Sh.	In.	18	13	20		II.	Oc.	Dis.	24	2	37		III.	Sh.	In.
	10	29		I.	Tr.	Eg.		15	58	39.7	I.	Ec.	Re.		2	52		III.	Tr.	Eg.
	11	21		I.	Sh.	Eg.		17	45	23.3	II.	Ec.	Re.		5	45		III.	Sh.	Eg.*
13	5	8		II.	Tr.	In.	19	10	13		I.	Tr.	In.		17	44		I.	Tr.	In.
	5	11		III.	Oc.	Dis.		10	59		I.	Sh.	In.		18	26		I.	Sh.	In.
	5	26		I.	Oc.	Dis.		12	31		I.	Tr.	Eg.		20	2		I.	Tr.	Eg.
	6	53		II.	Sh.	In.		13	16		I.	Sh.	Eg.		20	43		I.	Sh.	Eg.
	7	58		II.	Tr.	Eg.	20	4	21		IV.	Oc.	Dis.	25	14	58		I.	Oc.	Dis.
	8	13		III.	Oc.	Re.		6	42		IV.	Oc.	Re.		16	10		II.	Oc.	Dis.
	8	32	38.1	I.	Ec.	Re.		7	27		I.	Oc.	Dis.		17	53	18.1	I.	Ec.	Re.
	8	41	46.0	III.	Ec.	Dis.		7	55		II.	Tr.	In.		20	23	8.7	II.	Ec.	Re.
	9	45		II.	Sh.	Eg.		9	28		II.	Sh.	In.	26	12	15		I.	Tr.	In.
	11	39	45.6	III.	Ec.	Re.		9	35		III.	Oc.	Dis.		12	54		I.	Sh.	In.
14	2	42		I.	Tr.	In.		10	27	18.6	I.	Ec.	Re.		14	32		I.	Tr.	Eg.
	3	33		I.	Sh.	In.		10	46		II.	Tr.	Eg.		15	12		I.	Sh.	Eg.
	5	0		I.	Tr.	Eg.		11	17	42.3	IV.	Ec.	Dis.	27	9	28		I.	Oc.	Dis
	5	50		I.	Sh.	Eg.		12	20		II.	Sh.	Eg.		10	43		II.	Tr.	In.
	23	54		II.	Oc.	Dis.		12	38		III.	Oc.	Re.		12	3		II.	Sh.	In.
	23	56		I.	Oc	Dis.		12	40	49.8	III.	Ec.	Dis.		12	21	56.0	I.	Ec.	Re.
15	3	1	18.0	I.	Ec.	Re.		13	55	49.5	IV.	Ec.	Re.		13	34		II.	Tr.	Eg.
	4	25	54.8	II.	Ec.	Re.		15	39	50.4	III.	Ec.	Re.		14	0		III.	Oc.	Dis.
	21	13		I.	Tr.	In.	21	4	44		I.	Tr.	In.		14	54		II.	Sh.	Eg.
	22	1		I.	Sh.	In.		5	28		I.	Sh.	In.		19	39	51.1	III.	Ec.	Re.
	23	30		I.	Tr.	Eg.		7	1		I.	Tr.	Eg.	28	6	45		I.	Tr.	In.
16	0	19		I.	Sh.	Eg.		7	45		I.	Sh.	Eg.		7	23		I.	Sh.	In.
	18	27		I.	Oc.	Dis.	22	1	57		I.	Oc.	Dis.		9	3		I.	Tr.	Eg.
	18	31		II.	Tr.	In.		2	44		II.	Oc.	Dis.		9	41		I.	Sh.	Eg.
	19	22		III.	Tr.	In.		4	55	57.9	I.	Ec.	Re.		15	4		IV.	Tr.	In.
	20	10		II.	Sh.	In.		7	3	43.8	II.	Ec.	Re.		17	33		IV.	Tr.	Eg.
	21	22		II.	Tr.	Eg.		23	14		I.	Tr.	In.		20	36		IV.	Sh.	In.
	21	29	58.5	I.	Ec.	Re.		23	57		I.	Sh.	In.		23	25		IV.	Sh.	Eg.
	22	25		III.	Tr.	Eg.	23	1	31		I.	Tr.	Eg.	29	3	58		I.	Oc.	Dis.
	22	36		III.	Sh.	In.		2	14		I.	Sh.	Eg.		5	35		II.	Oc.	Dis.
	23	2		II.	Sh.	Eg.		20	27		I.	Oc.	Dis.		6	50	34.4	I.	Ec.	Re.
17	1	44		III.	Sh.	Eg.		21	19		II.	Tr.	In.		9	41	26.3	II.	Ec.	Re.
	15	43		I.	Tr.	In.		22	45		II.	Sh.	In.	30	1	15		I.	Tr.	In.
	16	30		I.	Sh.	In.		23	24	37.5	I.	Ec.	Re.		1	52		I.	Sh.	In.
	18	0		I.	Tr.	Eg.		23	47		III.	Tr.	In.		3	33		I.	Tr.	Eg.
	18	47		I.	Sh.	Eg.	24	0	10		II.	Tr.	Eg.		4	10		I.	Sh.	Eg.
18	12	57		I.	Oc.	Dis.		1	37		II.	Sh.	Eg.		22	28		I.	Oc.	Dis.

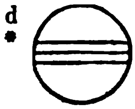
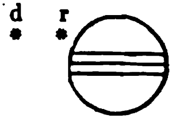
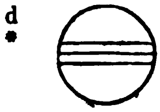
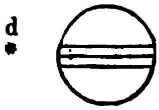
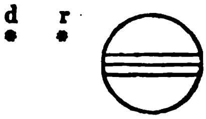
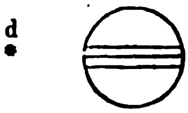
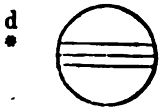
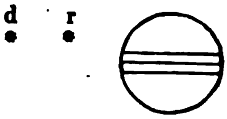
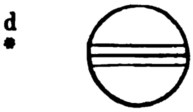
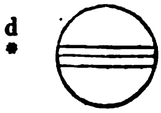
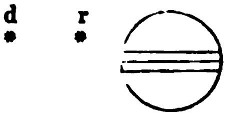
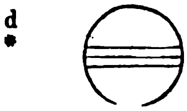
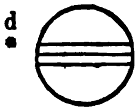
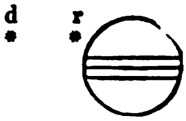
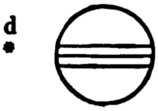
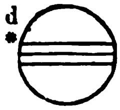
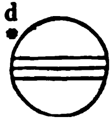
DECEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	0	7		II.	Tr.	In.	2	16	59		I.	Oc.	Dis.	4	16	22		II.	Tr.	Eg.
	1	19	12.8	I.	Ec.	Re.		19	1		II.	Oc.	Dis.		17	29		II.	Sh.	Eg.
	1	20		II.	Sh.	In.		19	47	52.7	I.	Ec.	Re.		18	27		III.	Oc.	Dis.
	2	58		II.	Tr.	Eg.		23	0	46.6	II.	Ec.	Re.		23	40	10.0	III.	Ec.	Re.
	4	12		II.	Sh.	Eg.	3	14	16		I.	Tr.	In.	5	8	47		I.	Tr.	In.
	4	15		III.	Tr.	In.		14	49		I.	Sh.	In.		9	18		I.	Sh.	In.
	6	37		III.	Sh.	In.		16	34		I.	Tr.	Eg.		11	5		I.	Tr.	Eg.
	7	21		III.	Tr.	Eg.		17	7		I.	Sh.	Eg.		11	36		I.	Sh.	Eg.
	9	46		III.	Sh.	Eg.	4	11	29		I.	Oc.	Dis.	6	5	59		I.	Oc.	Dis.
	19	46		I.	Tr.	In.		13	31		II.	Tr.	In.		8	27		II.	Oc.	Dis.
	20	20		I.	Sh.	In.		14	16	29.6	I.	Ec.	Re.		8	45	7.3	I.	Ec.	Re.
	22	4		I.	Tr.	Eg.		14	37		II.	Sh.	In.		12	19	0.9	II	Ec.	Re.
	22	38		I.	Sh	Eg.														

The Satellites are not visible after December 6th, Jupiter being too near the Sun.

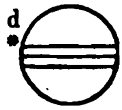
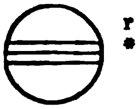
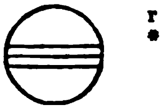
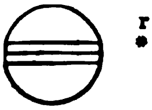
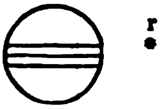
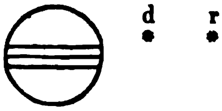
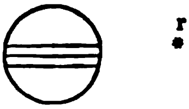
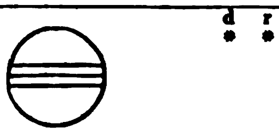
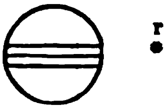
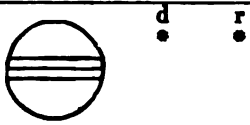
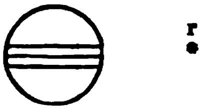
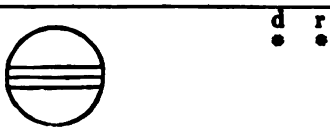
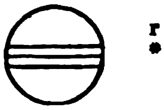
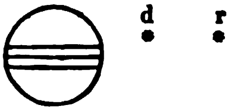
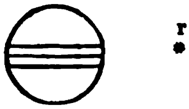
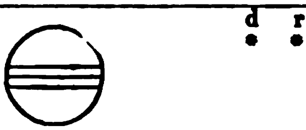
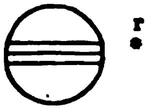
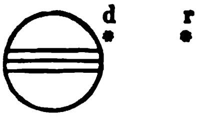
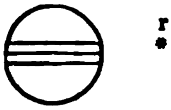
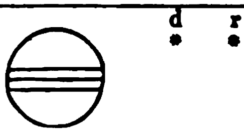
In., denotes ingress; Eg., egress: Dis., disappearance; Re., reappearance. *Visible at Washington.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

January. I.		III.	
II.		IV.	Not Eclipsed.
February. I.		III.	
II.		IV.	Not Eclipsed.
March. I.		III.	
II.		IV.	Not Eclipsed.
April. I.		III.	
II.		IV.	Not Eclipsed.
May. I.		III.	
II.		IV.	Not Eclipsed.
June. I.		III.	

Note.—Each diagram is given for the eclipse which occurs nearest the middle of the month.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

June. II.		IV.	Not Eclipsed.
July. I.		III.	
II.		IV.	Not Eclipsed.
August. I.		III.	
II.		IV.	
September. I.		III.	
II.		IV.	
October. I.		III.	
II.		IV.	
November. I.		III.	
II.		IV.	

NOTE.—Each diagram is given for the eclipse which occurs nearest the middle of the month.

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

	h m		h m		h m		h m
Jan. 2	7 9.6	Mar. 28	6 41.2	June 21	4 9.1	Sept. 14	1 51.4
4	1 39.8	30	1 9.4	22	22 35.0	15	20 20.0
5	20 10.0	31	19 37.5	24	17 1.0	17	14 48.8
7	14 40.2	April 2	14 5.6	26	11 27.0	19	9 17.6
9	9 10.3	4	8 33.7	28	5 53.1	21	3 46.6
11	3 40.3	6	3 1.5	30	0 19.1	22	22 15.5
12	22 10.4	7	21 29.5	July 1	18 45.2	24	16 44.6
14	16 40.5	9	15 57.3	3	13 11.4	26	11 13.6
16	11 10.5	11	10 25.2	5	7 37.6	28	5 42.7
18	5 40.5	13	4 52.8	7	2 3.8	30	0 11.8
20	0 10.6	14	23 20.5	8	20 30.1	Oct. 1	18 41.0
21	18 40.5	16	17 48.0	10	14 56.3	3	13 10.3
23	13 10.5	18	12 15.5	12	9 22.6	5	7 39.6
25	7 40.3	20	6 42.8	14	3 49.0	7	2 9.0
27	2 10.2	22	1 10.2	15	22 15.4	8	20 38.4
28	20 40.0	23	19 37.4	17	16 41.7	10	15 7.9
30	15 9.9	25	14 4.7	19	11 8.3	12	9 37.4
Feb. 1	9 39.6	27	8 31.8	21	5 34.8	14	4 7.0
3	4 9.4	29	2 58.9	23	0 1.4	15	22 36.6
4	22 39.1	30	21 25.9	24	18 28.1	17	17 6.2
6	17 8.8	May 2	15 52.9	26	12 54.9	19	11 35.9
8	11 38.3	4	10 19.7	28	7 21.7	21	6 5.6
10	6 8.0	6	4 46.6	30	1 48.6	23	0 35.3
12	0 37.5	7	23 13.4	31	20 15.5	24	19 5.1
13	19 7.1	9	17 40.2	Aug. 2	14 42.6	26	13 35.0
15	13 36.4	11	12 6.8	4	9 9.5	28	8 4.8
17	8 5.9	13	6 33.4	6	3 36.7	30	2 34.7
19	2 35.3	15	1 0.0	7	22 3.9	31	21 4.5
20	21 4.8	16	19 26.5	9	16 31.3	Nov. 2	15 34.4
22	15 34.0	18	13 52.9	11	10 58.5	4	10 4.4
24	10 3.4	20	8 19.4	13	5 25.9	6	4 34.4
26	4 32.5	22	2 45.7	14	23 53.5	7	23 4.5
27	23 1.8	23	21 12.0	16	18 21.0	9	17 34.6
Mar. 1	17 30.8	25	15 38.2	18	12 48.7	11	12 4.7
3	11 59.9	27	10 4.5	20	7 16.4	13	6 34.8
5	6 28.9	29	4 30.5	22	1 44.1	15	1 5.0
7	0 57.9	30	22 56.7	23	20 12.0	16	19 35.1
8	19 26.8	June 1	17 22.8	25	14 40.0	18	14 5.3
10	13 55.6	3	11 48.9	27	9 7.9	20	8 35.4
12	8 24.4	5	6 14.9	29	3 36.0	22	3 5.7
14	2 53.3	7	0 40.9	30	22 4.1	23	21 35.9
15	21 21.9	8	19 7.0	Sept. 1	16 32.2	25	16 6.2
17	15 50.6	10	13 33.1	3	11 0.4	27	10 36.5
19	10 19.1	12	7 59.0	5	5 28.8	29	5 6.8
21	4 47.7	14	2 25.1	6	23 57.3	30	23 37.2
22	23 16.0	15	20 51.1	8	18 25.7	Dec. 2	18 7.5
24	17 44.5	17	15 17.1	10	12 54.2	4	12 37.8
26	12 12.9	19	9 43.0	12	7 22.7	6	7 8.1

SATELLITE II.

	h m		h m		h m		h m
Jan. 2	20 52.1	Jan. 20	15 50.2	Feb. 7	10 41.7	Feb. 25	5 25.4
6	10 16.1	24	5 12.9	11	0 3.2	28	18 44.9
9	23 40.0	27	18 35.5	14	13 24.4	Mar. 4	8 4.2
13	13 3.7	31	7 57.7	18	2 45.1	7	21 23.0
17	2 27.1	Feb. 3	21 19.9	21	16 5.4	11	10 41.3

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

	h m		h m		h m		h m
Mar. 14	23 59.2	May 21	11 5.5	July 27	20 36.3	Oct. 3	8 39.5
18	13 16.7	25	0 13.9	31	9 46.8	6	22 1.4
22	2 33.6	28	13 21.8	Aug. 3	22 58.3	10	11 22.6
25	15 50.1	June 1	2 29.5	7	12 10.0	14	0 45.3
29	5 6.2	4	15 36.7	11	1 22.7	17	14 7.3
April 1	18 21.7	8	4 44.0	14	14 35.4	21	3 30.8
5	7 36.7	11	17 51.1	18	3 49.4	24	16 53.5
8	20 51.2	15	6 58.2	21	17 3.3	28	6 17.6
12	10 5.2	18	20 5.1	25	6 18.5	31	19 41.0
15	23 18.6	22	9 12.1	28	19 33.5	Nov. 4	9 5.8
19	12 31.6	25	22 19.2	Sept. 1	8 50.0	7	22 29.7
23	1 44.0	29	11 26.7	4	22 6.3	11	11 55.0
26	14 55.8	July 3	0 34.1	8	11 24.1	15	1 19.3
30	4 7.2	6	13 42.0	12	0 41.6	18	14 45.0
May 3	17 18.0	10	2 49.8	15	14 0.5	22	4 9.7
7	6 28.4	13	15 58.3	19	3 18.9	25	17 35.7
10	19 38.3	17	5 7.0	22	16 38.8	29	7 0.7
14	8 47.8	20	18 16.4	26	5 58.3	Dec. 2	20 27.0
17	21 56.9	24	7 25.9	29	19 19.3	6	[illegible] 52.3

SATELLITE III.

	h m		h m		h m		h m
Jan. 2	4 48.2	Mar. 29	7 37.5	June 23	1 49.0	Sept. 16	20 52.2
9	9 14.3	April 5	11 30.2	30	5 5.8	24	0 54.9
16	13 39.6	12	15 19.1	July 7	8 24.1	Oct. 1	5 0.7
23	18 2.7	19	19 3.0	14	11 44.9	8	9 10.1
30	22 23.8	26	22 42.1	21	15 9.4	15	13 23.1
Feb. 7	2 43.1	May 4	2 16.9	28	18 36.9	22	17 38.9
14	7 0.3	11	5 47.3	Aug. 4	22 8.6	29	21 58.2
21	11 15.2	18	9 13.6	12	1 44.1	Nov. 6	2 19.1
28	15 26.4	25	12 36.8	19	5 24.2	13	6 42.3
Mar. 7	19 34.3	June 1	15 57.6	26	9 9.3	20	11 6.6
14	23 39.9	8	19 15.8	Sep.t 2	12 59.0	27	15 32.5
22	3 40.6	15	22 33.0	9	16 53.7	Dec. 4	20 0.2

SATELLITE IV.

	h m		h m		h m		h m
Aug. 11	13 59.1	Sept. 14	0 4.3	Oct. 17	13 34.7	Nov. 20	5 31.3
28	6 33.8	30	18 26.8	Nov. 3	9 18.8		

In the following Tables x and y are the rectangular coördinates for each Satellite, referred to the centre of the primary and the major and minor axes of the apparent ellipse described by the Satellite. x is positive on the *east* side of the planet; negative on the *west* side. y is positive when *north;* negative when *south.*

x' and y' are the coördinates which correspond to a constant value of the major axis and maximum value of the minor axis, as seen from the sun at its mean distance.

The factors by which x' and y' must be multiplied to obtain the coöordinates x and y at any time, are given for each Satellite on pages 470–471.

p is the inclination of the minor axis of the apparent ellipse to the circle of declination; reckoned from the *north,* + towards the *east.*

COÖRDINATES IN THE MEAN APPARENT ELLIPSE DESCRIBED BY THE SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER FROM THE SUN, FOR THE TIME (*t*) AFTER GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

t	x'	y'	t	x'	y'	t	x'	y'
d h m	″	″	d h m	″	″	d h m	″	″
0 0 0	+ 0.0	+ 6.6	0 15 0	+ 87.1	− 4.0	1 6 0	−105.1	− 1.8
0 0 20	5.4	6.6	0 15 20	83.7	4.3	1 6 20	106.4	1.5
0 0 40	10.8	6.6	0 15 40	80.1	4.5	1 6 40	107.5	1.2
0 1 0	16.1	6.6	0 16 0	76.4	4.7	1 7 0	108.3	0.8
0 1 20	21.4	6.5	0 16 20	72.5	5.0	1 7 20	108.8	0.5
0 1 40	26.6	6.4	0 16 40	68.4	5.2	1 7 40	109.1	− 0.2
0 2 0	+ 31.8	+ 6.3	0 17 0	+ 64.1	− 5.4	1 8 0	−109.1	+ 0.1
0 2 20	36.9	6.2	0 17 20	59.6	5.5	1 8 20	108.9	0.5
0 2 40	42.0	6.1	0 17 40	55.0	5.7	1 8 40	108.4	0.8
0 3 0	46.9	6.0	0 18 0	50.3	5.9	1 9 0	107.6	1.1
0 3 20	51.7	5.8	0 18 20	45.5	6.0	1 9 20	106.6	1.4
0 3 40	56.4	5.7	0 18 40	40.5	6.1	1 9 40	105.3	1.8
0 4 0	+ 60.9	+ 5.5	0 19 0	+ 35.5	− 6.3	1 10 0	−103.8	+ 2.1
0 4 20	65.3	5.3	0 19 20	30.4	6.4	1 10 20	102.0	2.4
0 4 40	69.5	5.1	0 19 40	25.2	6.4	1 10 40	99.9	2.7
0 5 0	73.6	4.9	0 20 0	19.9	6.5	1 11 0	97.6	3.0
0 5 20	77.5	4.7	0 20 20	14.6	6.6	1 11 20	95.1	3.3
0 5 40	81.2	4.4	0 20 40	9.2	6.6	1 11 40	92.3	3.5
0 6 0	+ 84.7	+ 4.2	0 21 0	+ 3.8	− 6.6	1 12 0	− 89.3	+ 3.8
0 6 20	88.0	3.9	0 21 20	− 1.5	6.6	1 12 20	86.1	4.1
0 6 40	91.1	3.7	0 21 40	6.9	6.6	1 12 40	82.7	4.3
0 7 0	94.0	3.4	0 22 0	12.3	6.6	1 13 0	79.1	4.6
0 7 20	96.6	3.1	0 22 20	17.6	6.5	1 13 20	75.3	4.8
0 7 40	99.0	2.8	0 22 40	22.9	6.5	1 13 40	71.3	5.0
0 8 0	+101.1	+ 2.5	0 23 0	− 28.1	− 6.4	1 14 0	− 67.1	+ 5.2
0 8 20	103.0	2.2	0 23 20	33.3	6.3	1 14 20	62.8	5.4
0 8 40	104.7	1.9	0 23 40	38.4	6.2	1 14 40	58.3	5.6
0 9 0	106.1	1.6	1 0 0	43.4	6.1	1 15 0	53.7	5.8
0 9 20	107.3	1.3	1 0 20	48.3	5.9	1 15 20	49.0	5.9
0 9 40	108.1	0.9	1 0 40	53.1	5.8	1 15 40	44.1	6.1
0 10 0	+108.7	+ 0.6	1 1 0	− 57.7	− 5.6	1 16 0	− 39.1	+ 6.2
0 10 20	109.1	+ 0.3	1 1 20	62.2	5.4	1 16 20	34.0	6.3
0 10 40	109.1	− 0.1	1 1 40	66.6	5.2	1 16 40	28.9	6.4
0 11 0	109.0	0.4	1 2 0	70.8	5.0	1 17 0	23.7	6.5
0 11 20	108.6	0.7	1 2 20	74.8	4.8	1 17 20	18.4	6.5
0 11 40	107.9	1.0	1 2 40	78.6	4.6	1 17 40	13.0	6.6
0 12 0	+106.9	− 1.3	1 3 0	− 82.2	− 4.4	1 18 0	− 7.7	+ 6.6
0 12 20	105.7	1.7	1 3 20	85.6	4.1	1 18 20	− 2.3	6.6
0 12 40	104.2	2.0	1 3 40	88.9	3.8	1 18 40	+ 3.1	6.6
0 13 0	102.5	2.3	1 4 0	91.9	3.6	1 19 0	8.5	6.6
0 13 20	100.5	2.6	1 4 20	94.7	3.3	1 19 20	13.8	6.6
0 13 40	98.3	2.9	1 4 40	97.3	3.0	1 19 40	19.1	6.5
0 14 0	+ 95.8	− 3.2	1 5 0	− 99.6	− 2.7	1 20 0	+ 24.4	+ 6.5
0 14 20	93.1	3.5	1 5 20	101.7	2.4			
0 14 40	+ 90.2	− 3.7	1 5 40	−103.5	− 2.1			

COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE II.

t	*x′*	*y′*	*t*	*x′*	*y′*	*t*	*x′*	*y′*
d h m	″	″	d h m	″	″	d h m	″	″
0 0 0	+ 0.0	+12.2	1 6 0	+139.5	− 7.3	2 12 0	−166.4	− 3.5
0 0 40	8.5	12.2	1 6 40	134.2	7.7	2 12 40	168.6	2.9
0 1 20	17.0	12.1	1 7 20	128.6	8.2	2 13 20	170.4	2.3
0 2 0	25.5	12.1	1 8 0	122.7	8.6	2 14 0	171.9	1.8
0 2 40	33.9	12.0	1 8 40	116.5	9.0	2 14 40	173.0	1.2
0 3 20	42.2	11.8	1 9 20	110.1	9.4	2 15 20	173.6	− 0.6
0 4 0	+ 50.5	+11.7	1 10 0	+103.4	− 9.8	2 16 0	−173.8	0.0
0 4 40	58.6	11.5	1 10 40	96.4	10.1	2 16 40	173.6	+ 0.6
0 5 20	66.5	11.3	1 11 20	89.2	10.5	2 17 20	172.9	1.2
0 6 0	74.3	11.0	1 12 0	81.7	10.8	2 18 0	171.8	1.8
0 6 40	81.9	10.8	1 12 40	74.1	11.0	2 18 40	170.3	2.4
0 7 20	89.4	10.5	1 13 20	66.3	11.3	2 19 20	168.4	3.0
0 8 0	+ 96.6	+10.1	1 14 0	+ 58.3	−11.5	2 20 0	−166.2	+ 3.5
0 8 40	103.6	9.8	1 14 40	50.2	11.7	2 20 40	163.5	4.1
0 9 20	110.3	9.4	1 15 20	42.0	11.8	2 21 20	160.4	4.7
0 10 0	116.7	9.0	1 16 0	33.7	12.0	2 22 0	156.9	5.2
0 10 40	122.9	8.6	1 16 40	25.3	12.1	2 22 40	153.0	5.8
0 11 20	128.8	8.2	1 17 20	16.8	12.1	2 23 20	148.8	6.3
0 12 0	+134.4	+ 7.7	1 18 0	+ 8.3	−12.2	3 0 0	−144.2	+ 6.8
0 12 40	139.6	7.3	1 18 40	− 0.2	12.2	3 0 40	139.3	7.3
0 13 20	144.5	6.8	1 19 20	8.8	12.2	3 1 20	134.1	7.8
0 14 0	149.0	6.3	1 20 0	17.3	12.1	3 2 0	128.5	8.2
0 14 40	153.2	5.7	1 20 40	25.7	12.1	3 2 40	122.6	8.6
0 15 20	157.0	5.2	1 21 20	34.1	12.0	3 3 20	116.4	9.0
0 16 0	+160.5	+ 4.7	1 22 0	− 42.4	−11.8	3 4 0	−109.9	+ 9.4
0 16 40	163.6	4.1	1 22 40	50.6	11.7	3 4 40	103.1	9.8
0 17 20	166.3	3.5	1 23 20	58.7	11.5	3 5 20	96.1	10.1
0 18 0	168.6	3.0	2 0 0	66.7	11.3	3 6 0	88.9	10.5
0 18 40	170.5	2.4	2 0 40	74.5	11.0	3 6 40	81.5	10.8
0 19 20	171.9	1.8	2 1 20	82.1	10.7	3 7 20	73.9	11.0
0 20 0	+172.9	+ 1.2	2 2 0	− 89.5	−10.4	3 8 0	− 66.1	+11.3
0 20 40	173.6	+ 0.6	2 2 40	96.7	10.1	3 8 40	58.1	11.5
0 21 20	173.8	0.0	2 3 20	103.7	9.8	3 9 20	50.0	11.7
0 22 0	173.6	− 0.6	2 4 0	110.4	9.4	3 10 0	41.8	11.8
0 22 40	172.9	1.2	2 4 40	116.8	9.0	3 10 40	33.5	12.0
0 23 20	171.8	1.8	2 5 20	123.0	8.6	3 11 20	25.1	12.1
1 0 0	+170.4	− 2.4	2 6 0	−128.9	− 8.2	3 12 0	− 16.6	+12.1
1 0 40	168.5	3.0	2 6 40	134.5	7.7	3 12 40	− 8.1	12.2
1 1 20	166.2	3.5	2 7 20	139.7	7.2	3 13 20	+ 0.4	12.2
1 2 0	163.5	4.1	2 8 0	144.6	6.7	3 14 0	9.0	12.2
1 2 40	160.4	4.7	2 8 40	149.1	6.2	3 14 40	17.5	12.1
1 3 20	157.0	5.2	2 9 20	153.3	5.7	3 15 20	26.0	12.1
1 4 0	+153.2	− 5.8	2 10 0	−157.1	− 5.2	3 16 0	+ 34.4	+12.0
1 4 40	149.0	6.3	2 10 40	160.6	4.6			
1 5 20	+144.4	− 6.8	2 11 20	−163.7	− 4.1			

COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE III.

t	x′	y′	t	x′	y′	t	x′	y′
d h m			d h m			h d m		
0 0 0	+ 0″.0	+17″.4	2 12 0	+225″.4	−10″.1	5 0 0	−262″.3	− 5″.6
0 1 20	13.5	17.4	2 13 20	217.3	10.8	5 1 20	266.4	4.8
0 2 40	26.9	17.3	2 14 40	208.6	11.5	5 2 40	269.8	4.0
0 4 0	40.3	17.2	2 16 0	199.5	12.1	5 4 0	272.6	3.2
0 5 20	53.6	17.1	2 17 20	189.9	12.7	5 5 20	274.7	2.3
0 6 40	66.8	16.9	2 18 40	179.9	13.3	5 6 40	276.2	1.5
0 8 0	+ 79.8	+16.7	2 20 0	+169.4	−13.8	5 8 0	−277.0	− 0.6
0 9 20	92.7	16.4	2 21 20	158.5	14.3	5 9 20	277.2	+ 0.2
0 10 40	105.3	16.1	2 22 40	147.2	14.8	5 10 40	276.7	1.1
0 12 0	117.6	15.8	3 0 0	135.6	15.2	5 12 0	275.5	1.9
0 13 20	129.7	15.4	3 1 20	123.7	15.6	5 13 20	273.7	2.7
0 14 40	141.5	15.0	3 2 40	111.5	16.0	5 14 40	271.2	3.6
0 16 0	+153.0	+14.5	3 4 0	+ 99.0	−16.3	5 16 0	−268.1	+ 4.4
0 17 20	164.1	14.0	3 5 20	86.3	16.6	5 17 20	264.4	5.2
0 18 40	174.7	13.5	3 6 40	73.3	16.8	5 18 40	260.1	6.0
0 20 0	184.9	13.0	3 8 0	60.2	17.0	5 20 0	255.1	6.8
0 21 20	194.7	12.4	3 9 20	47.0	17.2	5 21 20	249.5	7.6
0 22 40	204.1	11.8	3 10 40	33.6	17.3	5 22 40	243.3	8.3
1 0 0	+213.0	+11.1	3 12 0	+ 20.2	−17.4	6 0 0	−236.6	+ 9.1
1 1 20	221.4	10.5	3 13 20	+ 6.7	17.4	6 1 20	229.3	9.8
1 2 40	229.3	9.8	3 14 40	− 6.8	17.4	6 2 40	221.4	10.5
1 4 0	236.6	9.1	3 16 0	20.3	17.4	6 4 0	213.0	11.1
1 5 20	243.3	8.3	3 17 20	33.7	17.3	6 5 20	204.1	11.8
1 6 40	249.5	7.6	3 18 40	47.1	17.2	6 6 40	194.7	12.4
1 8 0	+255.1	+ 6.8	3 20 0	− 60.3	−17.0	6 8 0	−184.9	+13.0
1 9 20	260.0	6.0	3 21 20	73.4	16.8	6 9 20	174.7	13.5
1 10 40	264.3	5.2	3 22 40	86.3	16.6	6 10 40	164.1	14.0
1 12 0	268.0	4.4	4 0 0	99.0	16.3	6 12 0	153.0	14.5
1 13 20	271.1	3.6	4 1 20	111.5	16.0	6 13 20	141.5	15.0
1 14 40	273.6	2.7	4 2 40	123.7	15.6	6 14 40	129.7	15.4
1 16 0	+275.5	+ 1.9	4 4 0	−135.7	−15.2	6 16 0	−117.6	+15.8
1 17 20	276.7	1.1	4 5 20	147.2	14.8	6 17 20	105.2	16.1
1 18 40	277.2	+ 0.2	4 6 40	158.4	14.3	6 18 40	92.6	16.4
1 20 0	277.0	− 0.6	4 8 0	169.3	13.8	6 20 0	79.8	16.7
1 21 20	276.2	1.5	4 9 20	179.8	13.3	6 21 20	66.8	16.9
1 22 40	274.7	2.3	4 10 40	189.9	12.7	6 22 40	53.6	17.1
2 0 0	+272.6	− 3.2	4 12 0	−199.5	−12.1	7 0 0	− 40.3	+17.2
2 1 20	269.8	4.0	4 13 20	208.6	11.5	7 1 20	26.9	17.3
2 2 40	266.4	4.8	4 14 40	217.3	10.8	7 2 40	− 13.4	17.4
2 4 0	262.3	5.6	4 16 0	225.5	10.1	7 4 0	+ 0.1	17.4
2 5 20	257.6	6.4	4 17 20	233.1	9.4	7 5 20	13.6	17.4
2 6 40	252.3	7.2	4 18 40	240.1	8.7	7 6 40	27.0	17.3
2 8 0	+246.4	− 8.0	4 20 0	−246.5	− 8.0	7 8 0	+ 40.4	+17.2
2 9 20	240.0	8.7	4 21 20	252.3	7.2			
2 10 40	+233.0	− 9.4	4 22 40	−257.6	− 6.4			

COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE IV.

t	x'	y'	t	x'	y'	t	x'	y'
d h	″	″	d h	″	″	d h	″	″
0 0	+ 0.0	+34.8	5 18	+406.2	−19.3	11 12	−449.0	−13.5
0 3	22.8	34.8	5 21	393.1	20.6	11 15	457.4	12.0
0 6	45.6	34.7	6 0	379.2	21.9	11 18	464.8	10.5
0 9	68.3	34.5	6 3	364.4	23.1	11 21	471.2	8.9
0 12	90.9	34.2	6 6	348.8	24.3	12 0	476.5	7.3
0 15	113.2	33.9	6 9	332.5	25.5	12 3	480.8	5.7
0 18	+135.3	+33.5	6 12	+315.4	−26.6	12 6	−484.0	− 4.1
0 21	157.1	33.0	6 15	297.6	27.6	12 9	486.2	2.5
1 0	178.5	32.4	6 18	279.2	28.5	12 12	487.3	− 0.8
1 3	199.6	31.8	6 21	260.2	29.4	12 15	487.3	+ 0.8
1 6	220.3	31.1	7 0	240.6	30.3	12 18	486.3	2.4
1 9	240.4	30.3	7 3	220.5	31.1	12 21	484.2	4.0
1 12	+260.0	+29.5	7 6	+199.9	−31.8	13 0	−480.9	+ 5.7
1 15	279.0	28.6	7 9	178.8	32.4	13 3	476.6	7.3
1 18	297.4	27.6	7 12	157.4	33.0	13 6	471.3	8.9
1 21	315.2	26.6	7 15	135.6	33.5	13 9	465.0	10.5
2 0	332.3	25.5	7 18	113.5	33.9	13 12	457.6	12.0
2 3	348.6	24.3	7 21	91.2	34.2	13 15	449.3	13.5
2 6	+364.1	+23.1	8 0	+ 68.7	−34.5	13 18	−440.0	+15.0
2 9	378.9	21.9	8 3	46.0	34.7	13 21	429.7	16.4
2 12	392.9	20.6	8 6	23.2	34.8	14 0	418.5	17.8
2 15	406.0	19.3	8 9	+ 0.3	34.8	14 3	406.3	19.2
2 18	418.2	17.9	8 12	− 22.5	34.8	14 6	393.2	20.6
2 21	429.5	16.5	8 15	45.3	34.7	14 9	379.3	21.9
3 0	+439.8	+15.0	8 18	− 68.0	−34.5	14 12	+364.6	+23.1
3 3	449.1	13.5	8 21	90.5	34.2	14 15	349.1	24.3
3 6	457.5	12.0	9 0	112.9	33.9	14 18	332.8	25.4
3 9	464.9	10.5	9 3	135.0	33.5	14 21	315.7	26.5
3 12	471.3	8.9	9 6	156.8	33.0	15 0	298.0	27.5
3 15	476.6	7.3	9 9	178.2	32.4	15 3	279.6	28.5
3 18	+480.8	+ 5.7	9 12	−199.3	−31.8	15 6	−260.5	+29.4
3 21	484.0	4.1	9 15	220.0	31.1	15 9	240.9	30.3
4 0	486.2	2.5	9 18	240.1	30.3	15 12	220.8	31.1
4 3	487.3	+ 0.8	9 21	259.7	29.5	15 15	200.2	31.8
4 6	487.3	− 0.8	10 0	278.7	28.6	15 18	179.2	32.4
4 9	486.3	2.4	10 3	297.2	27.6	15 21	157.7	33.0
4 12	+484.2	− 4.1	10 6	−315.0	−26.6	16 0	−135.9	+33.5
4 15	480.9	5.7	10 9	332.1	25.5	16 3	113.8	33.9
4 18	476.6	7.3	10 12	348.4	24.4	16 6	91.5	34.2
4 21	471.3	8.9	10 15	363.9	23.2	16 9	69.0	34.5
5 0	465.0	10.4	10 18	378.7	21.9	16 12	46.3	34.7
5 3	457.7	12.0	10 21	392.7	20.6	16 15	23.5	34.8
5 6	+449.3	−13.5	11 0	−405.8	−19.3	16 18	− 0.6	+34.8
5 9	439.9	15.0	11 3	418.0	17.9	16 21	+ 22.2	34.8
5 12	429.6	16.4	11 6	429.3	16.5	17 0	+ 45.0	+34.7
5 15	+418.4	−17.9	11 9	−439.6	−15.0			

SATELLITE I.

Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
1877.	Factor for x′.	Factor for y′.	p.	x.	y.
Jan. 2	0.839	−0.612	+4° 2′.3	−21″	−4″
9	0.846	0.612	3 20.3	23	4
16	0.855	0.613	2 39.5	25	4
23	0.865	0.615	1 59.9	27	4
30	0.876	0.618	1 21.7	28	4
Feb. 6	0.889	−0.622	+0 45.4	−30	−4
13	0.904	0.627	+0 11.2	31	4
20	0.920	0.633	−0 20.5	33	4
27	0.938	0.640	0 49.5	34	4
Mar. 7	0.957	0.648	1 15.5	36	4
14	0.977	−0.657	−1 38.2	−37	−4
21	0.998	0.667	1 57.3	38	4
28	1.021	0.678	2 12.5	38	4
Apr. 4	1.044	0.690	2 23.7	39	4
11	1.068	0.703	2 30.8	39	4
18	1.092	−0.716	−2 33.6	−39	−4
25	1.115	0.730	2 31.9	39	5
May 2	1.138	0.744	2 25.9	38	5
9	1.159	0.757	2 15.9	37	5
16	1.178	0.769	2 1.9	35	5
23	1.195	−0.780	−1 44.0	−33	−5
30	1.209	0.789	1 23 1	30	5
June 7	1.219	0.795	1 0.3	27	5
14	1.225	−0.799	−0 35.7	−24	−5
June 21	1.227	−0.800	−0° 10′.4	+23″	−5″
28	1.225	0.797	+0 14.6	26	5
July 5	1.219	0.791	0 38.7	29	5
12	1.209	0.782	1 0.8	32	5
19	1.194	0.769	1 20.3	34	5
26	1.177	−0.754	+1 36.6	+36	−5
Aug. 2	1.159	0.737	1 49.0	38	5
9	1.138	0.719	1 57.4	39	4
16	1.116	0.700	2 1.6	40	4
23	1.093	0.680	2 1.3	40	4
30	1.070	−0.660	+1 56.8	+40	−4
Sept. 7	1.047	0.640	1 47.9	40	4
14	1.025	0.620	1 34.8	39	4
21	1.004	0.601	1 17.7	38	4
28	0.983	0.582	0 57.0	37	4
Oct. 5	0.964	−0.564	+0 32.7	+36	−3
12	0.946	0.546	+0 5.2	35	3
19	0.929	0.529	−0 25.3	34	3
26	0.914	0.512	0 58.4	32	3
Nov. 2	0.900	0.496	1 34.0	31	3
9	0.888	−0.480	−2 11.7	+29	−3
16	0.877	0.465	2 51.3	27	3
23	0.868	0.451	3 32.3	25	3
30	0.860	−0.437	−4 14.5	+23	−3

SATELLITE II.

Date.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
1877.	Factor for x′.	Factor for y′.	p.	x.	y.
Jan. 2	0.839	−0.441	+3° 51′.2	−25″	−5″
9	0.846	0.440	3 9.8	28	5
17	0.855	0.439	2 29.7	30	5
24	0.865	0.439	1 50.8	33	5
31	0.877	0.440	1 13.3	35	5
Feb 7	0.891	−0.442	+0 37.7	−38	−5
14	0.906	0.444	+0 4.3	40	5
21	0.922	0.447	−0 26 6	42	5
28	0.940	0.451	0 54.9	44	5
Mar. 7	0.959	0.456	1 20.1	46	5
15	0.980	−0.461	−1 41.9	−48	−5
22	1.001	0.468	2 0.1	49	6
29	1.023	0.475	2 14.6	50	6
Apr. 5	1.047	0.483	2 25.1	51	6
12	1.071	0.491	2 31.3	51	6
19	1.095	−0.500	−2 33.2	−50	−6
26	1.118	0.510	2 30.9	49	6
May 3	1.141	0.519	2 24.3	47	6
10	1.162	0.528	2 13.5	45	6
17	1.181	0.536	1 58.8	42	6
25	1.198	−0.544	−1 40.9	−39	−6
Jnne 1	1.211	0.550	1 20.1	34	7
8	1.220	0.554	0 56.8	29	7
15	1.226	−0.556	−0 32.1	−24	−7
June 22	1.228	−0.556	−0° 7′.2	+24″	−7″
29	1.225	0.553	+0 17.5	29	7
July 6	1.217	0.548	0 41.1	34	7
13	1.206	0.541	1 2.6	39	6
20	1.191	0.532	1 21.3	43	6
27	1.173	−0.521	+1 36.7	+46	−6
Aug. 3	1.154	0.508	1 48.4	49	6
11	1.133	0.494	1 56.1	51	6
18	1.111	0.480	1 59.4	52	6
25	1.088	0.465	1 58.4	53	6
Sept. 1	1.065	−0.450	+1 53.1	+53	−5
8	1.043	0.435	1 43.6	53	5
15	1.021	0.420	1 30.0	52	5
22	1.000	0.405	1 12.5	51	5
29	0.979	0.391	0 51.3	49	5
Oct. 6	0.960	−0.379	+0 26.6	+48	−4
14	0.942	0.364	−0 1.2	46	4
21	0.926	0.351	0 31.9	44	4
28	0.911	0.339	1 5.2	41	4
Nov. 4	0.897	0.327	1 40.8	39	4
11	0.885	−0.315	−2 18.4	+36	−4
18	0.875	0.304	2 57.7	34	4
25	0.866	0.293	3 38.5	31	3
Dec. 4	0.859	−0.282	−4 20.5	+28	−3

SATELLITE III.

Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.				Date.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
1877.	Factor for x′.	Factor for y′.	p.	Dis.		Reap.		1877.	Factor for x′.	Factor for y′.	p.	Dis.		Reap.	
				x.	y.	x.	y.					x.	y.	x.	y.
			° ′	″	″	″	″				° ′	″	″	″	″
Jan. 2	0.839	−0.616	+4 13.3	-26	-11	. .	. .	June 23	1.228	−0.817	+0 5.5	. .	. .	+21	-14
9	0.846	0.617	3 30.6	30	11	-12	-11	30	1.224	0.812	0 30.7	. .	. .	30	14
16	0.856	0.619	2 49.0	34	11	16	11	July 7	1.216	0.804	0 54.6	. .	. .	38	14
23	0.865	0.622	2 8.7	39	11	20	11	14	1.205	0.793	1 16.5	. .	. .	45	14
30	0.877	0.627	1 29.8	43	11	23	11	21	1.190	0.780	1 35.1	+20	-13	52	13
Feb. 7	0.890	−0.632	+0 52.9	-47	-11	-27	-11	28	1.172	−0.764	+1 50.4	+26	-13	+58	-13
14	0.905	0.638	+0 18.3	50	11	30	11	Aug. 4	1.152	0.746	2 1.8	31	13	62	13
21	0.921	0.646	−0 13.8	54	11	33	11	12	1.131	0.727	2 8.8	35	13	65	13
28	0.939	0.654	0 43.1	57	11	35	11	19	1.108	0.707	2 11.5	38	12	68	12
Mar. 7	0.959	0.663	1 9.3	60	11	37	11	26	1.085	0.687	2 9.7	39	12	69	12
14	0.980	−0.673	−1 32.0	-62	-12	-39	-12	Sept. 2	1.062	−0.667	+2 3.4	+40	-11	+70	-11
22	1.002	0.685	1 50.9	64	12	40	12	9	1.039	0.647	1 52.7	40	11	70	11
29	1.024	0.697	2 5.9	65	12	41	12	16	1.016	0.627	1 37.9	40	11	69	11
Apr. 5	1.048	0.710	2 16.8	66	12	41	12	24	0.995	0.607	1 19.0	39	10	67	10
12	1.072	0.724	2 23.2	66	12	40	12	Oct. 1	0.975	0.588	0 56.4	37	10	64	10
19	1.096	−0.738	−2 25.2	-65	-13	-38	-13	8	0.956	−0.570	+0 30.2	+35	-10	+62	-10
26	1.119	0.753	2 22.7	63	13	35	13	15	0.938	0.554	+0 0.7	32	10	59	10
May 4	1.141	0.767	2 15.7	60	13	31	13	22	0.922	0.538	−0 31.8	29	9	56	9
11	1.163	0.780	2 4.6	56	13	26	13	29	0.907	0.523	1 6.6	25	9	52	9
18	1.183	0.792	1 49.5	50	14	-20	-14	Nov. 6	0.894	0.508	1 43.8	22	9	48	9
25	1.199	−0.803	−1 30.8	-44	-14	. .	. .	13	0.882	−0.493	−2 23.3	+18	- 8	+44	- 8
June 1	1.212	0.812	1 9.2	37	14	. .	. .	20	0.872	0.479	3 4.5	+14	- 8	40	8
8	1.221	0.817	0 45.4	29	14	. .	. .	27	0.864	0.465	3 47.0	. .	. .	36	6
15	1.227	−0.819	−0 20.3	-20	-14	. .	. .	Dec. 4	0.857	−0.453	−4 30.7	. .	. .	+32	- 8

SATELLITE IV.

Date.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.				Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
1877.	Factor for x′.	Factor for y′.	p.	Dis.		Reap.		1877.	Factor for x′.	Factor for y′.	p.	Dis.		Reap.	
				x.	y.	x.	y.					x.	y.	x.	y.
			° ′	″	″	″	″				° ′	″	″	″	″
Aug. 11	1.132	−0.576	+2 17.2	+79	-20	+91	-20	Oct. 17	0.934	−0.433	+0 2.2	+69	-15	+85	-15
28	1.078	0.538	2 17.2	89	19	101	19	Nov. 3	0.899	0.405	−1 18.9	55	14	71	14
Sept. 14	1.025	0.500	1 52.3	88	17	101	17	20	0.873	−0.379	−2 51.8	+38	-13	+56	-13
30	0.976	−0.465	+1 7.3	+81	-16	+95	-16								

THE APPARENT ELEMENTS OF SATURN'S RING.

Washington Mean Noon.		*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Ring.	*l′* The Elevation of the Sun above the Plane of the Ring.	*u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	*u′* Ecliptic,
Jan.	0	36″.52	5″.06	+6° 8′.4	+8° 3′.0	+5° 52′.7	328° 34′.3	285° 41′.6
	20	35.72	4.38	6 0.4	+7 5.7	5 35.6	326 48.0	283 55.4
Feb.	9	35.23	3.67	5 50.9	+6 0.4	5 18.4	324 47.1	281 54.6
March	1	35.08	2.96	5 40.4	+4 51.8	5 1.1	322 38.1	279 45.7
	21	35.25	2.29	5 29.6	+3 43.9	4 43.8	320 29.1	277 36.8
April	10	35.76	1.68	5 19.1	+2 41.8	4 26.5	319 28.0	275 35.8
	30	36.56	1.15	5 9.7	+1 48.7	4 9.1	376 41.9	273 49.8
May	20	37.64	0.75	5 2.2	+1 8.3	3 51.7	315 18.2	272 26.2
June	9	38.91	0.50	4 57.1	+0 44.0	3 34.2	314 22.7	271 30.8
	29	40.28	0.44	4 55.0	+0 37.8	3 16.7	314 0.0	271 8.2
July	19	41.59	0.61	4 56.2	+0 50.1	2 59.2	314 12.3	271 20.6
Aug.	8	42.66	0.98	5 0.4	+1 19.0	2 41.6	314 57.6	272 6.0
	28	43.29	1.49	5 6.8	+1 59.6	2 24.0	316 6.8	273 15.3
Sept.	17	43.35	2.06	5 14.0	+2 43.8	2 5.3	317 27.0	274 35.6
Oct.	7	42.82	2.52	5 20.6	+3 22.8	1 48.6	318 41.2	275 49.9
	27	41.80	2.77	5 25.1	+3 48.5	1 30.8	319 33.6	276 42.4
Nov.	16	40.50	2.77	5 26.8	+3 55.7	1 13.1	319 54.0	277 2.9
Dec.	6	39.13	2.53	5 25.3	+3 42.7	0 55.3	319 37.2	276 46.2
	26	37.85	2.09	5 20.7	+3 10.5	0 37.5	318 44.8	275 53.9
	31	37.55	1.96	+5 19.0	+3 0.0	+0 33.0	318 26.6	275 35.7

Factors which are to be multiplied by *a* and *b* to obtain the axes of

The inner ellipse of the outer Ring =0.8801 log Factor=9.9445
The outer ellipse of the inner Ring =0.8599 " =9.9344
The inner ellipse of the inner Ring =0.6650 " =9.8228
The inner ellipse of Bond's dusky Ring=0.5486 " =9.7392

Note. The sign of *l* indicates whether the visible surface of the Ring is northern or southern.

THE APPARENT DISCS OF VENUS AND MARS.

The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.

1877.		Venus.	Mars.	1877.		Venus.	Mars.
January	1	.861	.938	July	30	.915	.937
	31	.918	.919	August	29	.897	.995
March	2	.960	.895	September	28	.779	.972
April	1	.987	.876	October	28	.683	.913
May	1	.999	.862	November	27	.568	.880
	31	.993	.859	December	27	.411	.874
June	30	.966	.883				

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
Jan.	2	3	3	☌ ♅ ☾ ..... ♅ −	0	56
	8	21	36	☌ ♀ ♃ ..... ♀ +	0	34
	9	3	50	☌ ♂ ☾ ..... ♂ +	5	38
	10	10	41	☿ greatest elong. E.	18	57
	11	2	7	☌ ♃ ☾ ..... ♃ +	5	29
	11	6	51	☌ ♀ ☾ ..... ♀ +	5	54
	11	14	–	♆ stationary.		
	13	2	56	☿ in ☊		
	15	9	7	☌ ☿ ☾ ..... ☿ +	3	13
	17	6	–	☿ stationary.		
	17	8	54	☌ ♄ ☾ ..... ♄ −	1	20
	17	16	53	☿ in Perihelion.		
	21	16	7	□ ♆ ☉		
	22	2	12	☌ ♆ ☾ ..... ♆ −	6	20
	26	5	41	☌ ☿ ☉ Inf.		
	28	0	23	☿ greatest Hel. Lat. N.		
	29	12	27	☌ ♅ ☾ ..... ♅ −	0	54
	31	5	38	♀ in ☋		
Feb.	6	21	16	☌ ♂ ☾ ..... ♂ +	5	28
	7	4	–	☿ stationary.		
	7	10	53	☌ ☿ ♀ ..... ☿ +	2	52
	7	18	25	☌ ♃ ☾ ..... ♃ +	5	28
	10	8	33	☌ ☿ ☾ ..... ☿ +	5	38
	10	13	0	☍ ♅ ☉		
	10	15	16	☌ ♀ ☾ ..... ♀ +	3	0
	13	21	26	☌ ♄ ☾ ..... ♄ −	1	42
	18	9	7	☌ ♆ ☾ ..... ♆ −	6	39
	20	6	25	☿ greatest elong. W.	26	41
	20	12	7	☿ in ☋		
	21	8	28	♂ in ☋		
	25	21	51	☌ ♅ ☾ ..... ♅ −	1	1
	27	–	–	☾ eclipsed, invis. at Wash.		
	28	9	45	☌ ♄ ☉		
	28	22	20	☌ ♂ ♃ ..... ♂ −	0	32
Mar.	2	16	30	☿ in Aphelion.		
	7	7	55	♀ in Aphelion.		
	7	9	14	☌ ♃ ☾ ..... ♃ +	5	23
	7	16	6	☌ ♂ ☾ ..... ♂ +	4	36
	12	15	38	☌ ☿ ☾ ..... ☿ −	1	35
	13	5	6	☌ ♀ ☾ ..... ♀ −	1	24
	13	10	57	☌ ♄ ☾ ..... ♄ −	2	4
	14	–	–	☉ eclipsed, invis. at Wash.		
	15	16	44	☌ ♀ ♄ ..... ♀ +	0	20
	17	15	57	☌ ♆ ☾ ..... ♆ −	6	26
	18	17	20	☌ ☿ ♄ ..... ☿ −	0	37
	19	19	4	☉ enters ♈, spring com.		
	22	4	54	□ ♃ ☉		
	23	2	24	☿ greatest Hel. Lat. S.		
	25	5	33	☌ ♅ ☾ ..... ♅ −	1	5
	25	9	52	☌ ☿ ♀ ..... ☿ −	0	41
	29	0	19	♀ greatest Hel. Lat. S.		
April	3	21	44	☌ ♃ ☾ ..... ♃ +	5	10
	5	12	31	☌ ♂ ☾ ..... ♂ +	3	1
	5	19	56	☌ ☿ ☉ Sup.		
	10	1	8	☌ ♄ ☾ ..... ♄ −	2	31
	11	2	11	☿ in ☊		
	12	16	2	☌ ♀ ☾ ..... ♀ −	4	58
	13	21	4	☌ ☿ ☾ ..... ☿ −	3	57
	14	0	13	☌ ♆ ☾ ..... ♆ −	6	23
	14	13	10	☌ ♆ ☿ ..... ♆ +	2	32
	15	16	9	☿ in Perihelion.		
	19	8	–	♃ stationary.		
	21	11	29	☌ ♅ ☾ ..... ♅ −	0	59
	24	9	30	☌ ♆ ☉		
	24	10	14	□ ♂ ☉		
	25	23	39	☿ greatest Hel. Lat. N.		
	27	3	–	♅ stationary.		
	27	6	4	☌ ♆ ♀ ..... ♆ −	0	47
May	1	6	36	☌ ♃ ☾ ..... ♃ +	4	59
	2	23	43	☿ greatest elong. E.	21	5
	4	9	50	☌ ♂ ☾ ..... ♂ +	0	39
	6	8	7	☌ ♀ ☉ Sup.		
	7	15	1	☌ ♄ ☾ ..... ♄ −	3	3
	10	13	45	□ ♅ ☉		
	11	10	17	☌ ♆ ☾ ..... ♆ −	6	26
	12	18	4	☌ ♀ ☾ ..... ♀ −	5	32
	13	18	57	☌ ☿ ☾ ..... ☿ −	3	39
	14	1	–	☿ stationary.		
	18	17	18	☌ ♅ ☾ ..... ♅ −	0	44
	19	11	23	☿ in ☋		
	23	5	33	☌ ☿ ♀ ..... ☿ −	1	3
	24	9	6	♀ in ☊		
	26	2	36	☌ ☿ ☉ Inf.		
	28	11	4	☌ ♃ ☾ ..... ♃ +	4	51
	29	15	46	☿ in Aphelion.		
June	2	5	36	☌ ♂ ☾ ..... ♂ −	2	22
	4	3	12	☌ ♄ ☾ ..... ♄ −	3	37
	7	11	–	☿ stationary.		
	7	21	19	☌ ♆ ☾ ..... ♆ −	6	37
	9	16	5	☌ ☿ ☾ ..... ☿ −	9	23
	10	3	35	□ ♄ ☉		
	11	14	35	☌ ♀ ☾ ..... ♀ −	3	47
	15	1	3	☌ ♅ ☾ ..... ♅ −	0	25
	19	1	40	☿ greatest Hel. Lat. S.		
	19	5	27	☍ ♃ ☉		
	20	5	52	☿ greatest elong. W.	22	35
	20	15	10	☉ enters ♋, summer com.		
	24	12	5	☌ ♃ ☾ ..... ♃ +	4	53
	27	1	1	♀ in Perihelion.		
	30	14	–	♄ stationary.		
	30	18	59	☌ ♂ ☾ ..... ♂ −	5	33

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	'
July	1	12	17	☌ ♄ ☾ ..... ♄ −	4	4
	3	9	–	☉ in Apogee.		
	5	7	53	☌ ♆ ☾ ..... ♆ −−	6	51
	8	1	27	☿ in ☊		
	9	8	8	☌ ☿ ☾ ..... ☿ −	4	5
	11	11	8	☌ ♀ ☾ ..... ♀ −	0	42
	12	11	41	☌ ♅ ☾ ..... ♅ −	0	9
	12	15	25	☿ in Perihelion.		
	18	21	0	♀ greatest Hel. Lat. N.		
	19	12	13	☌ ☿ ☉ Sup.		
	21	12	30	☌ ♃ ☾ ..... ♃ +	5	0
	22	22	55	☿ greatest Hel. Lat. N.		
	24	4	34	☌ ♅ ♀ ..... ♅ −	0	54
	27	5	3	☌ ♂ ♄ ..... ♂ −	3	43
	28	1	36	♂ greatest Hel. Lat. S.		
	28	17	43	☌ ♄ ☾ ..... ♄ −	4	17
	28	18	20	☌ ♂ ☾ ..... ♂ −	8	7
	30	0	3	□ ♆ ☉		
Aug.	1	12	52	☌ ♅ ☿ ..... ♅ −	0	52
	1	16	36	☌ ♆ ☾ ..... ♆ −	7	2
	5	14	–	♂ stationary.		
	8	–	–	☉ eclipsed, invis. at Wash.		
	9	0	39	☌ ♅ ☾ ..... ♅ +	0	3
	9	20	–	♆ stationary.		
	9	22	29	☌ ☿ ☾ ..... ☿ +	1	27
	10	9	43	☌ ♀ ☾ ..... ♀ +	2	49
	15	10	39	☿ in ☋		
	17	6	16	☌ ♅ ☉		
	17	15	49	☌ ♃ ☾ ..... ♃ +	5	2
	19	21	–	♃ stationary.		
	21	0	32	♂ in Perihelion.		
	23	–	–	☾ eclip'd, partly vis. at Wash.		
	24	20	20	☌ ♄ ☾ ..... ♄ −	4	14
	24	20	37	☌ ♂ ☾ ..... ♂ −	8	46
	25	15	3	☿ in Aphelion.		
	25	16	7	☌ ♂ ♄ ..... ♂ −	4	32
	28	22	53	☌ ♆ ☾ ..... ♆ −	7	6
	30	23	50	☿ greatest elong. E.	27	10
Sept.	5	6	32	☍ ♂ ☉		
	5	14	20	☌ ♅ ☾ ..... ♅ +	0	14
	7	–	–	☉ eclipsed, invis. at Wash.		
	8	14	35	☌ ☿ ☾ ..... ☿ −	0	9
	8	21	9	☍ ♄ ☉		
	9	8	14	☌ ♀ ☾ ..... ♀ +	4	37
	12	22	0	♀ in ☋		
	13	10	–	☿ stationary.		
	14	0	13	☌ ♃ ☾ ..... ♃ +	4	55
	15	0	56	♀ greatest Hel. Lat. S.		
	17	2	35	□ ♃ ☉		
	20	11	46	☌ ♂ ☾ ..... ♂ −	6	48
	20	22	14	☌ ♄ ☾ ..... ♄ −	4	2
Sept.	22	5	40	☉ enters ♎, autumn com.		
	25	3	36	☌ ♆ ☾ .... ♆ −	7	2
	26	6	9	☌ ☿ ☉ Inf.		
Oct.	3	2	42	☌ ♅ ☾ ..... ♅ +	0	27
	4	0	44	☿ in ☊		
	5	2	–	♂ stationary.		
	5	4	52	☌ ☿ ☾ ..... ☿ +	3	1
	5	11	–	☿ stationary.		
	8	14	41	☿ in Perihelion.		
	9	5	58	☌ ♀ ☾ ..... ♀ +	3	47
	11	13	56	☌ ♃ ☾ ..... ♃ +	4	35
	11	19	15	☿ greatest elong. W.	18	6
	17	0	48	♀ in Aphelion.		
	17	16	33	☌ ♂ ☾ ..... ♂ −	4	28
	18	1	44	☌ ♄ ☾ ..... ♄ −	3	54
	18	22	11	☿ greatest Hel. Lat. N.		
	22	8	30	☌ ♆ ☾ ..... ♆ −	6	57
	24	0	2	♃ in ☋		
	28	17	50	☍ ♆ ☉		
	30	12	10	☌ ♅ ☾ ..... ♅ +	0	47
Nov.	3	11	56	☌ ♂ ♄ ..... ♂ +	0	11
	4	9	33	☌ ☿ ☾ ..... ☿ +	5	51
	8	5	27	☌ ♀ ☾ ..... ♀ +	1	30
	8	7	40	☌ ♃ ☾ ..... ♃ +	4	7
	8	21	15	♀ greatest Hel. Lat. S.		
	9	11	37	☌ ♀ ♃ ..... ♀ −	2	42
	11	9	54	☿ in ☋		
	13	0	7	☌ ☿ ☉ Sup.		
	14	8	15	☌ ♄ ☾ ..... ♄ −	4	0
	14	16	52	☌ ♂ ☾ ..... ♂ −	3	34
	15	23	–	♄ stationary.		
	18	15	3	☌ ♆ ☾ ..... ♆ −	6	57
	20	20	35	□ ♅ ☉		
	21	14	18	☿ in Aphelion.		
	26	18	48	☌ ♅ ☾ ..... ♅ +	1	8
Dec.	4	1	–	♅ stationary.		
	5	4	49	□ ♄ ☉		
	5	5	4	☌ ☿ ☾ ..... ☿ +	2	12
	6	3	26	☌ ♃ ☾ ..... ♃ +	3	37
	8	6	19	☌ ♀ ☾ ..... ♀ −	0	42
	10	18	30	♀ greatest elong. E.	47	19
	11	17	53	☌ ♄ ☾ ..... ♄ −	4	15
	12	0	12	☿ greatest Hel. Lat. S.		
	13	5	18	☌ ♂ ☾ ..... ♂ −	3	46
	14	10	39	☌ ☿ ♃ ..... ☿ −	2	11
	15	23	20	☌ ♆ ☾ ..... ♆ −	7	5
	20	23	42	☉ enters ♑, winter com.		
	22	12	17	♂ in ☊		
	24	0	33	☌ ♅ ☾ ..... ♅ +	1	25
	24	18	6	☿ greatest elong. E.	19	47
	30	19	–	☉ in Perigee.		
	30	23	58	☿ in ☊		

POSITIONS OF THE PRINCIPAL OBSERVATORIES.

(*North Latitudes and West Longitudes are considered as positive.*)

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Days.	Longitude from Washington in Arc.
	° ′ ″	h m s	d	° ′ ″
•Åbo,	+60 26 56.8	— 6 37 20.32	—.2759296	260 39 55.2
Albany,	+42 39 49.5	— 0 13 12.87	—.0091767	356 41 47.0
Allegheny,	+40 27 36.0	+ 0 11 50.66	+.0082252	2 57 39.9
Altona,	+53 32 45.3	— 5 47 58.54	—.2416498	273 0 21.9
Ann Arbor,	+42 16 48.0	+ 0 26 42.67	+.0185494	6 40 40 0
Armagh,	+54 21 12.7	— 4 41 36.92	—.1955662	289 35 46.2
Athens,	+37 58 20.0	— 6 43 7.58	—.2799488	259 13 6.3
Berlin,	+52 30 16.7	— 6 1 47.77	—.2512473	269 33 3.4
Bilk,	+51 12 25.0	— 5 35 17.77	—.2328445	276 10 33.4
•Bonn,	+50 43 45.0	— 5 36 36.02	—.2337502	275 50 59.7
Breslau,	+51 6 56.5	— 6 16 22.19	—.2613679	265 54 27.1
Brussels,	+50 51 10.7	— 5 25 41.29	—.2261723	278 34 40.7
Cambridge, (Eng.,)	+52 12 51.8	— 5 8 35.08	—.2142949	282 51 13.8
Cambridge, (Mass.,)	+42 22 48.1	— 0 23 41.54	—.0164530	354 4 36.9
Cape of Good Hope,	—33 56 3.2	— 6 22 8.09	—.2653711	264 27 58.7
Chicago,	+41 50 1.0	+ 0 42 14.26	+.0293317	10 33 33.9
Cincinnati,	+39 6 26.5	+ 0 29 46.94	+.0206822	7 26 44.1
Christiania,	+59 54 43.7	— 5 51 6.69	—.2438274	272 13 19.6
Clinton,	+43 3 16.5	— 0 6 35.08	—.0045727	358 21 13.8
Copenhagen,	+55 41 13.6	— 5 58 31.05	—.2489703	270 22 14.3
•Cracow,	+50 3 50.0	— 6 28 2.80	—.2694768	262 59 18.0
•Dorpat,	+58 22 47.0	— 6 55 6.02	—.2882641	256 13 29.7
Dublin,	+53 23 13.0	— 4 42 50.39	—.1964165	289 17 24.1
Durham,	+54 46 6.4	— 5 1 52.64	—.2096370	284 31 50.4
Edinburgh,	+55 57 23.2	— 4 55 29.34	—.2052007	286 7 39.9
•Florence,	+43 46 40.8	— 5 53 15.12	—.2453139	271 41 13.2
•Geneva,	+46 11 58.8	— 5 32 49.24	—.2311344	276 47 41.4
Georgetown,	+38 54 26.2	+ 0 0 6.20	+.0000718	0 1 33.0
•Göttingen,	+51 31 47.8	— 5 47 58.49	—.2416492	273 0 22.7
Gotha,	+50 56 37.5	— 5 51 3.39	—.2437892	272 14 9.2
Greenwich,	+51 28 38.2	— 5 8 12.39	—.2140323	282 56 54.2
Hamburg,	+53 33 7.0	— 5 48 5.95	—.2417355	272 58 30.8
•Helsingfors	+60 9 42.6	— 6 48 1.32	—.2833486	257 59 40.2
Hudson,	+41 14 42.6	+ 0 17 32.06	+.0121766	4 23 0.9
Kasan,	+55 47 24.2	— 8 24 41.14	—.3504761	233 49 42.9
Königsberg,	+54 42 50.6	— 6 30 11.87	—.2709707	262 27 2.0
•Kremsmünster,	+48 3 23.7	— 6 4 45.03	—.2532990	268 48 44.6
Leipsic,	+51 20 6.3	— 5 57 46.87	—.2484592	270 33 17.0
Leyden,	+52 9 20.3	— 5 26 8.57	—.2264881	278 27 51.5
Liverpool,	+53 24 47.7	— 4 56 12.34	—.2056984	285 56 54.9
Madras,	+13 4 9.2	—10 29 9.67	—.4369175	202 42 35.0
Madrid,	+40 24 29.7	— 4 53 27.00	—.2037847	286 38 15.0
•Mannheim,	+49 29 12.9	— 5 42 3.06	—.2375354	274 29 14.1

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Days.	Longitude from Washington in Arc.
	° ′ ″	h m s	d	° ′ ″
Markree, ...	+54 10 31.8	— 4 34 24.00	—.1905556	291 24 0.0
*Marseilles, . . .	+43 17 49.0	— 5 29 40.55	—.2289415	277 34 51.8
*Milan, ...	+45 28 0.7	— 5 44 58.20	—.2395625	273 45 27.0
*Modena, ...	+44 38 52.8	— 5 51 55.53	—.2443927	272 1 7.1
Moscow, ...	+55 45 19.8	— 7 38 29.29	—.3183946	245 22 40.7
*Munich, ...	+48 8 45.0	— 5 54 38.00	—.2462731	271 20 30.0
*Naples, ...	+40 51 46.6	— 6 5 10.95	—.2535990	268 42 15.8
New York, . . .	+40 43 48 5	— 0 12 15.47	—.0085124	356 56 0.8
Nicolajew, . . .	+46 58 20.6	— 7 16 6.53	—.3028534	250 58 22.1
*Olmütz, ...	+49 35 43.0	— 6 17 15.43	—.2619841	265 41 8.6
Oxford, ...	+51 45 35.5	— 5 3· 9.79	—.2105300	284 12 33.2
*Padua, ...	+45 24 2.5	— 5 55 41.17	—.2470043	271 4 42.5
*Palermo, ...	+38 6 44.0	— 6 1 37.00	—.2511227	269 35 45.0
Paramatta, . . .	—33 48 49.8	—15 12 18.64	—.6335491	131 55 20.4
*Paris, ...	+48 50 11.0	— 5 17 33.02	—.2205211	280 36 44.7
Philadelphia, . . .	+39 57 7.5	— 0 7 33.64	—.0052505	358 6 35.4
*Prague, ...	+50 5 18.5	— 6 5 53.52	—.2540917	268 31 37.2
Pulkowa, ...	+59 46 18.1	— 7 9 31.06	—.2982757	252 37 14.1
Rome, ...	+41 53 53.7	— 5 58 8.53	—.2487098	270 27 52.1
*San Fernando, . .	+36 27 45.0	— 4 43 22:42	—.1967873	289 9 23.7
Santiago, ...	—33 26 42.0	— 0 25 30.00	—.0177083	353 37 30.0
Senftenberg, . . .	+50 5 10.1	— 6 14 3.00	—.2597570	266 29 15.0
*Speyer, ...	+49 18 55.4	— 5 41 58.00	—.2374769	274 30 30.0
*Stockholm, . . .	+59 20 33.8	— 6 20 26.35	—.2641939	264 53 24.7
St. Petersburg, . .	+59 56 29.7	— 7 9 25.87	—.2982161	252 38 32.0
*Upsala, ...	+59 51 31.5	— 6 18 42.70	—.2629942	265 19 19.5
*Utrecht, ...	+50 5 10.5	— 5 28 43.67	—.2282832	277 49 5.0
*Vienna, ...	+48 12 35.5	— 6 13 44.09	—.2595381	266 33 58.7
Washington, . . .	+38 53 38.8	0 0 0.00	.0000000	0 0 0.0
*Wilna, ...	+54 50 59.1	— 6 49 23.33	—.2842978	257 39 10.1

The authorities for these positions are given in the volumes for 1871 and 1872.

More recent telegraphic determinations, made by the *United States Coast Survey*,[*] give the longitude of Cambridge, Mass., $-0^{h}\,23^{m}\,41^{s}.11$, that of Greenwich, $-5^{h}\,8^{m}\,12^{s}.12$, and that of Paris, $-5^{h}\,17^{m}\,33^{s}.22$.

The correction therefore to be applied to the longitudes of Ann Arbor, Cambridge, (Mass.), Chicago, and Clinton, in the preceding table, is $+0^{s}.43 = +0^{d}.0000050 = +6''.45$; to the longitudes of places marked with an *, $-0^{s}.13 = -0^{d}.0000015 = -1''.95$; and to the longitudes of other places not in the United States, $+0^{s}.30 = +0^{d}.0000035 = +4.''50$.

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[*] *Report of U. S. Coast Survey*, 1872, p. 234.

ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

THE NAUTICAL PART.

THIS Part of the AMERICAN EPHEMERIS AND NAUTICAL ALMANAC is designed for the special use of NAVIGATORS and adapted to the Meridian of Greenwich. It contains the Ephemeris of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain Fixed Stars; the Ephemeris of the planets Venus, Mars, Jupiter, and Saturn; and the Mean Places of 196 principal Fixed Stars for the beginning of the year 1877.

Time.—Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

Sidereal Time.—Sidereal Time is measured by the daily motion of the stars, or as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour angle is called the *Sidereal Time.* Astronomical clocks are regulated to sidereal time.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

The vernal equinox is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical. In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the sidereal time in common use might therefore be called *Apparent Sidereal Time;* and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed $2^s.3$ in a period of nineteen years, and is, therefore, of no practical importance.

Solar Time.—Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity.

Mean Time, which is perfectly equable in its increase, is measured by the motions of this *Mean Sun;* the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it. The clocks in ordinary use, and chronometers used by Navigators, are regulated to *mean* time.

True or *Apparent Time* is measured by the motion of the real sun.

The difference between the *apparent* and *mean* time is called the *Equation of Time.* By means of it we change *apparent* to *mean* time, or the reverse. Thus, if the *apparent* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *apparent* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

Day.—The *civil day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; the first of which is marked A. M., the last is marked P. M.

The *astronomical day* commences at noon of the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical, as well as the civil, time may be either *apparent* or *mean*, according as it is reckoned from *apparent* noon, or from *mean* noon.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day.* Thus, January 9th, 2^h A. M., *civil time*, is January 8th, 14^h, *astronomical time;* and January 9th, 2^h P. M., *civil time*, is also January 9th, 2^h, *astronomical time.* The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

If the longitude from Greenwich be expressed in time, and, when it is *west, added* to the local time, or, when it is *east, subtracted* from the local time, the result is the corresponding Greenwich time. If the local astronomical time is used, the result is the *Greenwich astronomical time,* which ordinarily is required for the use of this Part of the Ephemeris.

THE CALENDAR.—The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows:

Page I. contains the *Apparent Right Ascension and Declination* of the Sun and the *Equation of Time* for each Greenwich *apparent* noon. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity for a given *Greenwich apparent time.* The hourly differences are given for the instant of apparent noon at Greenwich, and, when great accuracy is required, should be first interpolated for *half* the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is 0. The longitude from Greenwich expressed in time, if *west,* is at that instant the Greenwich apparent time, or time *after* Greenwich apparent noon; if *east,* it is time *before* Greenwich apparent noon. The longitude is therefore employed in reducing the quantities on this page to apparent noon at any place.

The Right Ascension of the sun thus reduced is the *Sidereal Time of Local Apparent Noon*. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on *Sidereal* time.

The Declination of the sun reduced to the meridian, or apparent noon, of the place, is needed in finding the latitude from a meridian altitude of the sun.

As an example of the use of this page, let the sun's declination be required at noon of January 3d, 1877, in longitude 146° 4′ W., or $+ 9^h 44^m 16^s$. We first find

	″	°	′	″
For January 3d, at Greenwich *apparent* noon, ⊙'s declination		= 22	47	33.0 S.
The diff. for 1 hour, +15″.18, multiplied by 9, is	136.62			
The proportional part for $30^m = \frac{1}{2}^h$,	7.59			
" " " $12^m = \frac{1}{5}^h$,	3.04			
" " " $2^m = \frac{1}{30}^h$,	.51			
" " " $15^s = \frac{1}{8}$ of 2^m,	.06			
The sum to be subtracted,	147.82 or		2	27.8 N.
The sun's declination required,		22	45	5.2 S.

The longitude $9^h\ 44^m\ 16^s = 9^h\ 44^m.27 = 9^h.738$; and $15''.18 \times 9.738 = 147''.82 = 2'\ 27''.82$; which is also the reduction obtained in another way.

If the longitude is 146° 4′ E., the reduction, 2′ 27″.8, should be added, and the resulting declination becomes 22° 50′ 0″.8 S.

If greater precision is required, the hourly difference may be first interpolated for $4^h\ 52^m$ (or half the longitude) *after* noon for the *west* longitude, or for $4^h\ 52^m$ *before* noon for the *east* longitude. This will give, in the first case, the hourly difference 15″.41, and the resulting declination 22° 45′ 3″.0 S.; and, in the second case, the hourly difference 14″.95, and the declination 22° 49′ 58″.6 S.

At sea, however, it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V. of BOWDITCH's *American Practical Navigator*.

The *Equation of Time*, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent* time, or the time given by an observation of the sun, to obtain the *mean* time. The heading of the column directs the manner in which the equation is to be applied. Where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. As given on page I., the equation of time is the *mean* time of *apparent* noon, or the hour angle of the mean sun at that instant.

On page I. are also given the *Sun's Semidiameter*, which is used in reducing the altitude of a limb of the sun, or the angular distance of the limb from the moon or some other object, to the altitude, or distance, of the centre of the sun; and the *Sidereal Time of the Semidiameter passing the Meridian*, which is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the *first*, or western, limb, to be subtracted from the time of transit of the *second*, or eastern, limb.

Page II. contains for each Greenwich *mean* noon the *Apparent Right Ascension* and *Declination of the Sun*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given for noon, and may be used in reducing them to any given Greenwich *mean* time. The hourly changes may be first interpolated for *half* the Greenwich time, when great precision is required.

The Right Ascension and Declination on pages I. and II. are affected by ***Aberration***, and therefore denote the *apparent* position of the *true* sun. Page II. is more conveniently used when the *mean* time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to *mean* time. The quantities can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the local time from observations of the sun, and the latitude from other than meridian observations. The heading of the column directs the manner in which it is to be applied to *mean* time to obtain the *apparent* time.

As given on page II., the equation is the apparent time of mean noon; and in general it is the hour angle of the *true* sun at the instant of *mean* noon.

The *Sidereal Time of Mean Noon* is also the *Right Ascension of the Mean Sun.* It may be reduced for the longitude, or to any Greenwich *mean* time, by using the hourly difference, $9^s.8565$; or by Table III. in the appendix of the *American Ephemeris* for *reducing intervals of mean solar to sidereal time.* Table LI. of Bowditch's *Navigator* may be used for the same purpose when the nearest quarter of a second only is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting solar time to sidereal time. If we add the right ascension of the *true* sun to the *apparent* time, or the right ascension of the *mean* sun to the *mean* time, the result will be the *sidereal* time.

The sidereal time of mean noon reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a *sidereal interval to a mean time interval* in Table II. of the *American Ephemeris*, or Table LII. of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given *sidereal* time.

As examples of the use of page II.:

1. Let the sun's right ascension and the equation of time be required for 1877, Aug. 3, $6^h\ 12^m\ 13^s$ A. M. mean time at a place whose longitude is 118° 14′ E.

	h m s
The local astronomical *mean* time is	Aug. 2, 18 12 13
The longitude in time,	— 7 52 56
The Greenwich *mean* time,	Aug. 2, 10 19 17
	or Aug. 2, 10.3214

	Sun's R. A.		*Equation of time.*
	h m s		m s
Aug. 2, *Noon*,	8 50 42.66	Aug. 2, *Noon*,	5 58.47 ***Subtractive.***
H. D. $9^s.678 \times 10.3214$	+ 1 39.89	H. D. $-0^s.178 \times 10.3214$	— 1.84
	8 52 22.55		5 56.63

If greater precision is required, the hourly differences interpolated to $5^h.2$, or $9^s.673$ for the right ascension, and $0^s.183$ for the equation of time, should be used.

The equation of time in this example is ***subtractive from*** mean time. Its reduction could have been found by Table VI. A. of Bowditch's *Navigator* to seconds only.

2. If the sidereal time is required for the same date and time, we have

	h m s
Aug. 2, *Noon*, the R. A. of the mean sun is	8 44 44.19
Add the H. D. $9^s.8565 \times 10.3214$, or	+ 1 41.73
Add the local *astronomical* mean time	18 12 13.00
The required sidereal time is, (rejecting 24^h,)	2 58 38.92

The reduction $1^m\ 41^s.73$ could have been found in Table III. corresponding to the Greenwich mean time, $10^h\ 19^m\ 17^s$. By Table LI. of Bowditch's *Navigator*, the reduction is $1^m\ 41^s.7$.

3. 1877, Aug. 3, A. M., at a place whose longitnde is 118° 14′ E., suppose the sidereal time to be $2^h\ 58^m\ 38^s.92$, and that the corresponding mean time is required.

The astronomical day is Aug. 2; the longitude in time $-7^h\ 52^m\ 56^s$, or $-7^h.882$.

	h	m	s
Aug. 2, the sidereal time of Greenwich mean noon is	8	44	44.19
The H. D. $9^s.8565 \times (-7.882)$, or the red. for $7^h\ 52^m\ 56^s$ in Table III.	—	1	17.69
The sidereal time of local noon,	8	43	26.50
The given sidereal time ($+24^h$, if necessary)	26	58	38.92
Subtracting the first from the second gives the *sidereal interval* from noon	18	15	12.42 $= 18^h.254$
$-9^s.8296 \times 18.254$, or the red. for $18^h\ 15^m\ 12^s$ in Table II.,	—	2	59.42
The required astronomical mean time, Aug. 2,	18	12	13.00

Page III. contains the *Longitude* and *Latitude of the Sun*, and the *Logarithm of its Distance from the Earth*, at Greenwich mean noon of each day. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ' the same coördinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The longitudes of the sun are the true longitudes, not affected by aberration. The latitude is referred to the ecliptic of the date.

The last column on page III. contains the *Mean Time of Sidereal* 0^h, or 24^h—the right ascension of the mean sun. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich *sidereal* time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II. of the American Ephemeris, for *reducing intervals of sidereal time to mean solar time*, or approximately, from Table LII. of Bowditch's *Navigator*.

This column is used in converting sidereal time to mean time. As an illustration, let us take Example 3, above.

	h	m	s
Aug. 2, the mean time of Greenwich sidereal 0^h is	15	12	45.86
The H. D. $-9^s.8296 \times (-7.882)$, or the red. for long., Table II.,	+	1	17.48
The mean time of local sid. 0^h,	15	14	3.34
Add the given sidereal time,	2	58	38.92 $= 2^h.977$
The sum is	18	12	42.26
$-9^s.8296 \times 2.977$, or the red. for $2^h\ 58^m\ 39^s$ in Table II.,	—		29.26
The required astronomical mean time, Aug. 2,	18	12	13.00

It was readily seen, in advance, that the sum of the mean time of sidereal 0^h and the given sidereal time would be less than 24^h. Were it more than 24^h, the mean time of sidereal 0^h should be taken out for Aug. 1, that is the *preceding* astronomical day.

Page IV. contains the *Moon's Semidiameter* and *Equatorial Horizontal Parallax* for every mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time in the same way as the sun's declination and the equation of time in the preceding examples. The sign *plus or minus* (+ or —) prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273. It may also be obtained from Table XI. of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1877, Mar. 20, 9^h P. M. Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Mar. 20 is $4''.4$; then as $12^h : 9^h = 4''.4 : 3''.3$
which is the correction to be *added to* the semidiameter at noon, because the semidiameter is *increasing*. The moon's semidiameter then, for Mar. 20, 9^h, is $15'\ 45''.1 + 3''.3$, or $15'\ 48''.4$

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for *half* the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Meridian Passage* at Greenwich, which is given on page IV. to minutes and tenths of minutes, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH's Table XXVIII. by simple inspection. The last column of this page contains the *Age* of the Moon, or the time elapsed since the preceding new moon, to tenths of days.

Pages V. to XII., inclusive, contain the *Moon's Right Ascension* and *Declination* for each day and hour of Greenwich *mean* time. They are accompanied with columns of *differences for one minute*, which are also given at each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. The Greenwich mean time, which is required for taking out these quantities, may be taken directly from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. Each is taken out for the day and hour of the Greenwich *mean* time; the *diff. for* 1^m multiplied by the *minutes* and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1877, Jan. 7, $15^h\ 15^m\ 20^s$, astronomical mean time at Greenwich:

	Right Ascension.		*Declination*
	h m s		° ′ ″
Jan. 7, 15^h	14 10 8.14		17 31 33.2 S.
Diff. $2^s.0512 \times 15.333$	= + 31.45	$12''.252 \times 15.333$	= 3 7.9 S.
Jan. 7, $15^h\ 15^m\ 20^s$	14 10 39.59		17 34 41.1 S.

The differences interpolated for $7^m.67 = 0^h.13$ are for the right ascension $2^s.0515$, and for the declination $12''.240$, which may be used for greater precision.

Page XII. contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII. to XVIII., inclusive, contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, the four larger planets, and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore *astronomical*. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W., or E., is affixed to the name of the sun, planet, or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a *Lunar Distance*, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the *true*, or *geocentric*, distance. With this distance and the distances in the Ephemeris of the same bodies on the same day, the *Greenwich mean time* of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris between every two successive distances the *logarithm of the seconds of time in which the distance changes* 1″, or, as it is usually called, the *proportional logarithm of the difference*. It is given for the *middle* instant of the two hours between which it is placed.

For computing the *Greenwich time* we have the following rule:

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the *P. L. of Diff.* between them:

Find the difference between the true distance and the distance taken from the Almanac; and from the *proportional logarithm* of this difference subtract the *P. L. of Diff.* taken from the Almanac:

The result is the *proportional logarithm* of an interval of time to be *added* to the hours of Greenwich time, taken from the Almanac, when the *earlier* Almanac distance is used; to be *subtracted* from the hours of Greenwich time, when the *later* Almanac distance is used.

Another method is, to *add* the *common logarithm* of the difference of the true and the Almanac distances to the *P. L. of Diff.* of the Almanac; the sum will be the *common logarithm* of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time*, given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the *P. L. of Diff.* in the Ephemeris varies, the Greenwich time, found by the methods just described, may not be sufficiently exact. To correct it for such variation, or *2d difference*, take the difference between the *P. L. of Diff.* used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones.) With this difference, and the first correction of the Greenwich time already found, enter Table I. Appendix, and take out the corresponding seconds, which are to be *added* to the approximate Greenwich time if the *Prop. Logs.* in the Ephemeris are *decreasing;* to be *subtracted* if they are *increasing.*

Thus the *Greenwich mean time* of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer time and the Greenwich mean time will be the *error* of the chronometer as found from the Lunar Distance. The agreement or disagreement of this error with that brought up from the error and rate of a previous date, may show whether the chronometer has run well or ill. In this way Lunar Distances can be used as a check upon the chronometer. By a series of carefully observed Lunar Distances on both sides of the moon, the chronometer error can be tolerably well ascertained.

If the observer has found the *local mean time* of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the Lunar Distance will be his longitude.

As an example of finding the Greenwich mean time from a Lunar Distance, suppose that in 1877, Jan. 6, about 2h of Greenwich astronomical time, the corrected distance of the moon's centre from Antares is 51° 17′ 43″:

Corrected distance,		51° 17′ 43″		
Distance in the Ephemeris, Jan. 6, 3h 0m 0s,		51 6 33	P. L.	.2577
Difference,		0 11 10	P. L.	1.2073
Time from 3h (*before*)	— 0 20 13		P. L.	.9496
Corr. for 2d Diff., Table I,	— 2			
Greenwich Mean Time, Jan. 6,	2 39 45			

By a Table of common logarithms, or a Table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

From Ephemeris,		P. L.	0.2577
Diff. of distances,	0° 11′ 10″ = 1670″	log	2.8261
Red. of Greenwich time,	∓ 0h 20m 13s = 1213s	log	3.0838

the result being the same as by the previous method.

Pages 218 to 241, inclusive, contain the Ephemerides of the four principal planets, Venus, Mars, Jupiter, and Saturn. The Ephemeris of each consists of its *apparent right ascension* and *declination*, and their *variations in one hour*, for each Greenwich mean noon; the *mean time of meridian passage;* and, at the bottom of the page, the *semidiameter* and *horizontal parallax*.

North declinations are marked +, south declinations —. + prefixed to the hourly change of declination of the sun, moon, or a planet, indicates that north declinations are increasing, and south declinations are decreasing; — indicates that north declinations are decreasing, south declinations increasing.

The right ascension and declination are needed in all observations of the planet for time, latitude, or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples of the sun previously given. The mean time of passage across any meridian can be found by dividing the *daily* difference by 24, and using the *hourly* difference thus obtained, as in the case of the moon; or, the reduction can be found by the proportion: As 24^h (or 360°) is to the longitude, so is the daily difference to the reduction required.

Pages 259 to 262 contain the *Mean Places*, with their *annual variations*, of one hundred and ninety-eight Fixed Stars for the beginning of the year 1877. North declinations are marked +; south declinations —.

The right ascension of a star is also the *sidereal time* of its meridian passage. From this we may roughly find the mean time of meridian passage by adding the *mean time of sidereal* 0^h on page III. of the Calendar, or subtracting the *sidereal time of mean noon* on page II., (disregarding seconds;) but we can find it more exactly by the processes already given for converting sidereal time to mean time.

The right ascension and declination of a star are generally needed when it has been observed for time, latitude, or azimuth. The mean places are sufficiently accurate for most observations at sea; but for more exact observations, the *apparent* places should be used.

THE ASTRONOMICAL PART.

This part is adapted to the meridian of Washington; and Washington time, *astronomical* or *sidereal*, is required in its use. The longitude of Washington from Greenwich is assumed to be $+5^{h}\ 8^{m}\ 12^{s}$.

Obliquity of the Ecliptic, &c., page 248.—This page contains for every ten days of the year the *Apparent Obliquity*, which is required for the transformation of longitudes and latitudes to right ascensions and declinations, or the reverse; the *Equation of Equinoxes* in longitude and right ascension, or the reduction from the *mean* to the *true* equinox of the date; the *Precession of Equinoxes* in longitude, or the reduction of longitudes from the mean equinox of the *beginning* of the year to the mean equinox of the *date;* the *Sun's Aberration*, which is to be applied to the *true* longitude of the sun, as given in the Ephemeris, to obtain its *apparent* longitude; the Sun's *Horizontal Parallax;* and the *Mean Longitude of the* Moon's *Ascending Node.*

At the bottom of the page are given the *Mean Obliquity* for the beginning of the year; the *Annual Precession* for the middle of the year, the precession in a sidereal and in a solar day, and the *daily motion* of the moon's node in longitude.

Fixed Stars.—Pages 249–257 contain for each mean midnight the logarithms of A, B, C, D, also f, G, H, i, and logarithms of g, h, and i, (following Bessel's notation,) for reducing the *mean* places of the Fixed Stars at the beginning of the year to their *apparent* places on any day.

The formulæ by which they are prepared, and those in which they are used, are given on page 258. The coefficients are those of Peters and Struve. In terms of right ascension they are expressed in time.

The first set of quantities requires for the star the logarithms of a, b, c, d, a', b', c', d', which are to be found in the Star Catalogues. The other set requires no other star constants than the right ascensions and declinations. f, G, and H are given in time, as well as arc, to facilitate their use with tables of sines, &c., which have the argument in time. Such a table is given in the Appendix.

Tables IV., VI. and VII., in the Appendix, facilitate the computation of terms depending on 2☾ and ☾ $-\Gamma$.

For a star near the pole, it is best to compute the reductions with the mean right ascension and declination at the date instead of the beginning of the year, (or the logarithms of a, b, c, &c., reduced to the date), and add such of the following terms as may be of sufficient magnitude:

In *Right Ascension.*

$$\left.\begin{array}{l} +0^{s}.000003\ \tau^{2}\sin\alpha \\ -0^{s}.000149\ \tau^{2}\cos\alpha \end{array}\right\}\tan\delta$$

$$\left.\begin{array}{l} -0^{s}.0000650\ \tau^{2}\sin 2\alpha \\ +0^{s}.0000103\sin 2\,☊\cos 2\alpha \\ -0^{s}.0000107\cos 2\,☊\sin 2\alpha \end{array}\right\}\tan^{2}\delta$$

$$\left.\begin{array}{l} +0^{s}.0000620\sin 2\odot\cos 2\alpha \\ -0^{s}.0000622\cos 2\odot\sin 2\alpha \end{array}\right\}\sec^{2}\delta$$

$$\left.\begin{array}{l} +0^{s}.0000513\sin(\odot+☊)\cos 2\alpha \\ -0^{s}.0000507\cos(\odot+☊)\sin 2\alpha \\ +0^{s}.0000097\sin(\odot-☊)\cos 2\alpha \\ -0^{s}.0000053\cos(\odot-☊)\sin 2\alpha \end{array}\right\}\tan\delta\sec\delta$$

In *Declination.*

$$\left.\begin{array}{l} +0''.000975\ \tau^{2}\sin^{2}\alpha \\ -0''.000023\cos 2\,☊ \\ -0''.000080\cos 2\,☊\cos 2\alpha \\ -0''.000077\sin 2\,☊\sin 2\alpha \\ +0''.000040\cos 2\odot \\ -0''.000467\cos 2\odot\cos 2\alpha \\ -0''.000465\sin 2\odot\sin 2\alpha \end{array}\right\}\tan\delta$$

$$\left.\begin{array}{l} -0''.00004\cos(\odot+☊) \\ -0''.00038\cos(\odot+☊)\cos 2\alpha \\ -0''.00038\sin(\odot+☊)\sin 2\alpha \\ -0''.00038\cos(\odot-☊) \\ -0''.00004\cos(\odot-☊)\cos 2\alpha \\ -0''.00007\sin(\odot-☊)\sin 2\alpha \end{array}\right\}\sin\delta\tan\delta$$

Pages 259–262 contain the *mean places* and *annual variations* of 198 Fixed Stars for 1877, Jan. $0^{d}-.469$, or the instant when the sun's mean longitude is 280°. τ on the preceding pages is reckoned from the same epoch. Stars within 25° of either pole are designated by a *.

The *apparent* places of α, δ, and λ Ursæ Minoris, and of 51 Cephei, are given on pages 263–274 for every upper transit at Washington. They include the terms depending on 2 ☾ and ☾ $-\Gamma'$, as well as other small terms given above and on page 258, so far as they were of sufficient importance.

The *apparent* places of the remaining 194 stars follow on pages 275–323, in the order of their right ascensions. They are given for every tenth transit, together with their motions in ten days; and include all terms of the preceding formulæ exceeding $0^s.003$ in right ascension, or $0''.03$ in declination, except those which depend on 2 ☾ and ☾ — Γ′. The mean solar time of transit is also given to the nearest tenth of a day.

Solar Ephemeris.—Pages 324–329 contain the *Apparent Right Ascension* and *Declination* of the Sun for each mean and apparent noon at Washington; the *Hourly Motion* at mean noon; the *Equation of Time* at apparent noon with the sign of its application to apparent time; the Sun's *Semidiameter* and the *Sidereal Time of its passing the Meridian;* and the *Sidereal Time of Mean Noon.* The explanation of these quantities and their use has already been given on pages 478–481.

The Sun's *Horizontal Parallax* is given on page 248.

Moon Culminations.—Pages 330–332 contain the mean solar time of the *Upper Transit* of the Moon's *centre* at Washington, expressed to hundredths of a minute, the *difference* for *one hour* of longitude, and the *Sidereal Time of Semidiameter passing the Meridian,* both given for the instant of transit at Washington. The numbers in the fifth column indicate the Stars in the list of *Moon Culminating Stars,* pages 333–336, within 30^m of the moon in right ascension. The two preceding and the two next following the moon, are proper to be observed with the moon at each transit. The *bright Limb* of the Moon is indicated by the Roman numerals in the last column.

The time of transit at any place, within six hours of Washington in longitude, may be found with sufficient accuracy from the time of the Washington transit by using the hourly difference interpolated for a longitude from Washington equal to *half* that of the given place. With this time reduced to Greenwich time the moon's right ascension can be taken from the Lunar Ephemeris, pages V–XII of each month, as in the example on page 482. If greater precision is required, or the place is more than six hours from Washington, we may, from the right ascension thus obtained, (which is nearly the *local sidereal time,*) find the *local mean time,* as on page 481, more accurately than before, and thence the *Greenwich mean time,* and with this revise the computation.

As an example, suppose the right ascension of the bright limb of the moon to be required at the transit of January 4, 1877, at Berlin, in longitude

$6^h\ 1^m\ 47^s.50 = 6^h.0299 = 0^d.2512$ East of Washington.
$0\ 53\ 35.50$ “ Greenwich.

				h m
Transit at Washington, (p. 330)			Jan. 4,	16 59.44
Corr. for longitude		$-6.0299\times1^m.919$		— 11.57
Transit at Berlin,			Jan. 4,	16 47.87
Longitude from Greenwich,				— 0 53.59
Greenwich mean time,			Jan. 4,	15 54.28
	h m			h m s
Moon's R.A., Jan. 4,	16 0			11 47 28.12
Reduction for	— 5.72	$-5.72\times2^s.0311$		— 11.62
Moon's R.A., Jan. 4,	15 54.28			11 47 16.50
Sid. time of semidiameter passing,				+ 1 6.28
R.A. of II, or bright limb,				11 48 22.78

The diff. for 1^h of long., $1^m.919$, is found by interpolating *back* $0^d.126$ from that given on page 330; and $2^s.0311$, the change of R. A. in 1^m, by interpolating *back* 3^m from that given on page 6 for Jan. 4, 16^h. The time of the semidiameter passing the meridian is interpolated *back* $0^d.2512$ from that given on page 330, for Jan. 4, and is added to the right ascension of the centre, as the bright limb is II., or the following one.

The Greenwich mean time computed from the right ascension of the centre is $15^h\ 54^m\ 16^s.89$, and the consequent correction of that right ascension, $+0^s.01$.

Moon-Culminating Stars, **pages 333–336.**—The *mean* places, with their annual variations, of 138 stars near the moon's path are given for the beginning of the fictitious year (1877, Jan. $0^{d}-.469$). The names of those whose *apparent* places are given in the Ephemeris of the *Fixed Stars* are printed in SMALL CAPITALS.

The *apparent* places of the others may be obtained by the quantities and formulæ on pages 249–258. To illustrate the use of these, suppose the apparent place of No. 66, β Virginis, one of the four stars proper to be observed with the moon on January 4, be required at its transit of that date at Berlin.

The Washington mean time of the transit at Berlin is January 4, $10^{h}\ 46^{m}$, or $0^{d}.05$ before midnight of January 4. The quantities from page 249, or page 252, are to be taken out for this time.

1st *Method.*

(Star Tables)	log a	0.488	log b	7.465*n*	log c	8.823*n*	log d	7.660
(p. 249)	log A	9.079	log B	0.919*n*	log C	0.686*n*	log D	1.296
(Star Tables)	log a'	1.301*n*	log b'	8.836*n*	log c'	9.634	log d'	8.631*n*
	log Aa	9.567	log Bb	8.384	log Cc	9.509	log Dd	8.956
	log Aa'	0.380*n*	log Bb'	9.755	log Cc'	0.320*n*	log Dd'	9.927*n*

(p. 333)	$\alpha =$	$11^{h}\ 44^{m}\ 17^{s}.23$		$\delta =$	$+\ 2^{\circ}\ 27'\ 27''.2$
	$Aa =$	$+\ .369$		$Aa' =$	-2.40
	$Bb =$	$+\ .024$		$Bb' =$	$+0.57$
	$Cc =$	$+\ .323$		$Cc' =$	-2.09
	$Dd =$	$+\ .090$		$Dd' =$	-0.85
$\mu = +0^{s}.053$	$\tau\mu =$	$+\ .001$	$\mu' = -0''.28$	$\tau\mu' =$	0.00
Apparent Place,	$\alpha' =$	$11\ 44\ 18.04$		$\delta' =$	$+\ 2\ 27\ 22.4$

2d *Method.*

$\alpha = 11^{h}\ 44^{m}.3$	$\delta = +\ 2^{\circ}\ 27'.5$
$G = 19\ \ 4.7$	$G+\alpha = 6^{h}\ 49^{m}.0 = 102^{\circ}\ 15'.0$
$H = 23\ \ 4.6$	$H+\alpha = 10\ 48.9 = 162\ 13.5$

log $\frac{1}{15}$	8.824	log $\frac{1}{15}$	8.824	$\alpha =$	$11^{h}\ 44^{m}\ 17^{s}.23$
log g	0.937	log h	1.308	$f =$	$+\ .370$
l. sin $(G+\alpha)$	9.990	l. sin $(H+\alpha)$	9.486	$(g) =$	$+\ .024$
l. tan δ	8.633	l. sec δ	0.000	$(h) =$	$+\ .414$
log (g)	8.384	log (h)	9.617	$\tau\mu =$	$+\ .001$
Apparent Right Ascension				$\alpha' =$	$11\ 44\ 18.04$
log g	0.937	log h	1.308		
l. cos $(G+\alpha)$	9.327*n*	l. cos $(H+\alpha)$	9.979*n*	$\delta =$	$+\ 2^{\circ}\ 27'\ 27''.2$
log (g')	0.264*n*	l. sin δ	8.632	$(g') =$	$-\ 1.84$
		log (h')	9.919*n*	$(h') =$	$-\ 0.83$
log i	0.325*n*			$(i) =$	$-\ 2.11$
l. cos δ	0.000			$\tau\mu' =$	0.00
log (i)	0.325*n*	*Apparent Declination* . . .		$\delta' =$	$+\ 2\ 27\ 22.4$

The MOON's *Semidiameter* and *Equatorial Horizontal Parallax* for each mean noon and midnight are on pages 337–340.* In the moon's Ephemeris, as in that of the sun, the hourly motions belong to the instants for which they are given. The hourly change of semidiameter is equal to .2723 times that of the horizontal parallax.

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* For eclipses and occultations, BURCKHARDT's value of the semidiameter, which is $2''.5$ less, is preferred.

The times of the *Moon's Phases*, *Apogee*, *Perigee*, and *greatest Libration*, are given on page 341; the position of the *Moon's Equator* and the *Moon's mean longitude* on page 342; and a Table for computing the *Libration* of the Moon on page 343.

The *Ephemerides of the seven principal Planets* (pages 344–385) are given both for *mean noon* and the time of *transit*. The *hourly differences* are also given for the same instants. Third differences were used in their computation.

The *Horizontal Parallaxes*, *Vertical Semidiameters*, *and Sidereal Times of the Semidiameters passing the Meridian*, are on pages 386 and 387.

The *Sun's Coördinates* (pages 388–399) are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator at the beginning of the year, (Jan. $0^d.0$.) In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:). The latitude is referred to the ecliptic of the date. The reduction to the mean ecliptic of Jan. 0, is $+0''.488\,\tau\sin(\odot+187^\circ)$, in which τ is the time from Jan. 0, in parts of a year.

The *Heliocentric Coördinates* of the Planets (pages 400–406) are referred to the mean equinox and ecliptic of the mean noon of the 2405,000th day of the Julian Period, or 1872, July 25.

The columns $-\frac{k^2}{r^3}x$, &c., contain the quantities $-1600\,m\frac{k^2}{r^3}x$, $-1600\,m\frac{k^2}{r^3}y$, $-1600\,m\frac{k^2}{r^3}z$, in units of the 7th decimal place, in which m denotes the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.2355814$.

Page 407 contains the *Inclinations and Longitudes of the Ascending Nodes* at the same epoch, and the *Masses* of the several Planets with their logarithms. The changes of the Inclinations and Nodes in 100 days are also given.

The Heliocentric Coördinates and Masses of the Planets are given for the computation of perturbations.

Eclipses.—Pages 408–414 contain the elements necessary for computation and the principal phases of each eclipse of the SUN and MOON. The semidiameters of the moon are $2''.5$, and those of the sun $2''.2$, less than those in the Ephemeris.

The charts of the *Solar Eclipses* show the part of the world in which each is visible. The dotted curves pass through places where the eclipse begins, or ends, at an exact hour of Washington mean time, and aid in finding an approximate time of the beginning, or end, at any place. The limits and central line will give some idea of the magnitude of the eclipse. The longitudes are reckoned west from Washington.

The Tables of *Data of the Solar Eclipses* contain certain quantities* derived from the elements and independent of the place of observation. They are given for successive times at the Washington meridian; and if their values for the *Penumbra* be taken out for a time T_0, assumed near that of the beginning, or end, of the eclipse at any place, the prediction for that place may be computed quite accurately by the following formulæ:

Let φ = the latitude of the place, + when north,
λ = its longitude from Washington, + when west,
(*Bessel*,) $\log e = 8.912205$, $\log(1-e^2) = 9.9970916$, $\sin\chi = e\sin\varphi$,
$h = \sec\chi\cos\varphi$, $k = (1-e^2)\sec\chi\sin\varphi$,

$$a = A - h\sin(\mu-\lambda),$$
$$b = B - E\,k + G\,h\cos(\mu-\lambda),$$
$$c = -C + F\,k - H\,h\cos(\mu-\lambda),$$
$$m = \sqrt{b\,c} \qquad \text{(usually with same sign as } a\text{).}$$

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[*] The formulæ are given in CHAUVENET's *Spherical and Practical Astronomy*, Vol. I, page 513. The changes of A, B, and C for *one minute*, or *one second*, are expressed in units of the sixth decimal place.

If $m=a$, the time T_0 is correctly chosen. If m differ from a, a correction t of the asuumed time may be obtained in seconds by the formulæ,

$$\log\mu' = 1.86167, \qquad a' = A' - \mu' h \cos(\mu-\lambda,)$$

$$\tan\tfrac{1}{2}Q = \frac{c}{m} = \frac{m}{b} \qquad b' = B' - \mu' G h \sin(\mu-\lambda,)$$

$$t = \frac{1000000\,(m-a)}{a' + b' \cot Q}$$

and a new approximation to the actual Washington time will be

$$T_0' = T_0 + t,$$

with which the computation may be revised.

Thus successive approximations are made until for the last assumed time T_0, $m=a$ very closely, and t is quite small. The local mean time of the phenomenon will be, using the last values of T_0 and t,

$$T_0 + t - \lambda.$$

Q must be taken of the same sign with a, and is a sufficiently near approximation to the angular distance of the point of contact reckoned from the *north* point of the sun's limb, + towards the *east*.

For a total or annular eclipse, the prediction of the interior contacts may be made in the same way, using the *Data* for the *Shadow;* except that Q will have a sign opposite that of a in a total eclipse.

To find V, the angular distance of the point of contact from the *Vertex* of the sun's limb, + towards the *left*, we have the formulæ

$$p\sin P = \sin\varphi \qquad c\sin C = \cos P \tan(\mu-\lambda)$$

$$p\cos P = \cos\varphi\cos(\mu-\lambda) \qquad c\cos C = \sin(P-\delta')$$

$$V = Q - C,$$

in which δ' is the sun's declination.

If the values of Q at the beginning and at the end of the eclipse be found, and their difference (with regard to signs) be denoted by 2θ, the number of digits eclipsed is

$$12(1+n)\sin^2\tfrac{1}{2}\theta, \qquad \text{or } 12(1+n)\cos^2\tfrac{1}{2}\theta,$$

according as θ is acute or obtuse; n being the quotient of the semidiameter of the moon divided by that of the sun.

θ may also be found from the formulæ:

$$\tan R = \frac{b'}{a'} \qquad \theta = Q + R$$

(in which R has the sign of b'); and the expression of t may be changed to

$$t = 1000000 \,.\, \frac{m-a}{a'} \,.\, \frac{\sin Q \cos R}{\sin\theta}.$$

The following is an example of the computation of the beginning of the Eclipse of September 6, 1877, for the Observatory at Santiago, for which

$\varphi = -33^\circ\,26'\,42''.0$ $\qquad\lambda = 353^\circ\,37'\,30''.0$

(1) $\log e = 8.912205$

(2) $\text{l.}\sin\varphi = 9.7412590\,n$ $\qquad$ (1) + (2) $\qquad \text{l.}\sin\chi = 8.653464\,n$

(3) $\log(1-e^2) = 9.9970916$

(4) $\text{l.}\sec\chi = 0.0004406$ $\qquad$ (2) + (3) + (4) $\qquad \log k = 9.7387912\,n$

(5) $\text{l.}\cos\varphi = 9.9213822$ $\qquad$ (4) + (5) $\qquad \log h = 9.9218228$

By the chart, or from a previous computation, the Washington mean time of the beginning of the eclipse at Santiago is $18^h\,8^m\,20^s$, for which we take from the table for *Penumbra*, on page 411, the values of A, B, C, &c.

Computation of t, the correction of T_0.

$\mu = 272^\circ\ 37'\ 24''.1$

$\lambda = 353\ \ 37\ \ 30.0$

$\mu - \lambda = 278\ \ 59\ \ 54.1$

(1) $\text{l. sin}\ (\mu - \lambda) = 9.9946219\,n$

(2) $\log h = 9.9218228$

(3) $\text{l. cos}\ (\mu - \lambda) = 9.1942540$

(4) = (1) + (2) $\log h \sin (\mu - \lambda) = 9.9164447\,n$

(5) $\log \mu' = 1.86167$

(6) $\log G = 8.996205$

(7) = (2) + (3) $\log h \cos (\mu - \lambda) = 9.1160768$

(8) $\log H = 9.034891$

(6) + (7) $\log G h \cos (\mu - \lambda) = 8.112282$

(7) + (8) $\log H h \cos (\mu - \lambda) = 8.150968$

(5) + (7) $\log \mu' h \cos (\mu - \lambda) = 0.97775$

(4) + (5) + (6) $\log \mu' G h \sin (\mu - \lambda) = 0.77432\,n$

(20) $\log b = 9.660268$

(21) $\log c = 9.783968$

(22) $= \frac{1}{2}$ [(20) + (21)] $\log m = 9.722118\,n$

(22) − (20) = (21) − (22) $\text{l. tan}\ \frac{1}{2} Q = 0.061850\,n$

Angle from N. point, $Q = 98^\circ\ 8'.0$

(28) $\text{l. cot}\ Q = 9.15508$

(29) $\log b' = 1.84825\,n$

(28) + (29) $\log b' \cot Q = 1.00333\,n$

(31) $\log (m - a) + 6 = 1.3010\,n$

(32) $\log (a' + b' \cot Q) = 1.0876$

(31) − (32) $\log t = 9.2134\,n$

(9) $\log E = 9.997861$

(10) $\log k = 9.738791\,n$

(11) $\log F = 9.997440$

(9) + (10) $\log E k = 9.736652\,n$

(10) + (11) $\log F k = 9.736231\,n$

(12) $A = -1.35233$

(13) $-h \sin (\mu - \lambda) = +0.82498$

(14) $B = -0.10090$

(15) $-E k = +0.54532$

(16) $G h \cos (\mu - \lambda) = +0.01295$

(17) $-C = +1.16704$

(18) $F k = -0.54479$

(19) $-H h \cos (\mu - \lambda) = -0.01416$

(12) + (13) $a = -0.52735$

(14) + (15) + (16) $b = +0.45737$

(17) + (18) + (19) $c = +0.60809$

$m = -0.52737$

$m - a = -0.00002$

(23) $A' = +\ 142.33$

(24) $-\mu' h \cos (\mu - \lambda) = -\ 9.50$

(25) $B' = -\ 76.46$

(26) $-\mu' G h \sin (\mu - \lambda) = +\ 5.95$

(25) + (26) $b' = -\ 70.51$

(27) = (23) + (24) $a' = +\ 132.83$

(30) $b' \cot Q = -\ 10.08$

(27) + (30) $a' + b' \cot Q = +\ 122.75$

Assumed time, ... $T_0 = 18^h\ 8^m\ 20^s.0$
Correction of the assumed time, ... $t = \quad -\ 0.2$
Washington time of the beginning . . . . $18\ \ 8\ \ 19.8$
Santiago time of the beginning . . . . . September 6^d, $18\ \ 33\ \ 49.8$

We have also $C = -124^\circ\ 17'$; the angle from the *Vertex*, $V = -137^\circ\ 35'$; $\theta = 70^\circ\ 6'$, and the magnitude of the eclipse 8.1 digits, or 0.67 of the sun's disc, on the north limb.

Occultations.—Pages 415–446 contain *Elements for facilitating the Prediction of Occultations of Planets and Stars by the Moon.* The list includes all stars to the $6\frac{1}{2}$ magnitude in the *Catalogue of the British Association*, and a few others of less magnitude, contained in the *Almanac Catalogue of Zodiacal Stars* and chiefly belonging to clusters, which can be occulted during the year 1877.

Pages 447–449 contain a list of such occultations and near approaches as will be visible at Washington during the year 1877. For the latter, the time of nearest approach, the nearest point of the moon's limb and the distance of the star from the moon's limb are stated.

The elements comprise the *Date*, *the Name*, *Magnitude and Declination of the Star*; the *Limiting Latitudes* within which the occultation may be visible; and, at the time of geocentric conjunction of the moon and star in right ascension, the following quantities:

$\mathcal{T}$ = Washington mean time,
H = Hour angle of the star at Washington, + when west;
$X = \dfrac{15\ (\alpha - \alpha')}{\pi} \cos \delta = 0, \qquad Y = \dfrac{\delta - \delta'}{\pi},$
$x' = \dfrac{15\, \Delta \alpha}{\pi} \cos \delta, \quad y' = \dfrac{\Delta \delta}{\pi}$, the hourly changes of x and y;

in which α and δ are the true right ascension and declination of the moon,

$\Delta\,\alpha$ and $\Delta\,\delta$, their motions in one hour of mean time,

π, the moon's equatorial horizontal parallax,

α' and δ', the apparent right ascension and declination of the star.

The reductions of the mean place of the star at the beginning of the year to its apparent place at the date, are also given to facilitate the reduction of observed occultations.

For any other Washington mean time $T=\delta+t$, we have (μ being the sidereal equivalent of t, and t as a coefficient being expressed in hours)

$h=H+\mu$, the star's hour angle at Washington,

$$x=t\,x', \qquad y=Y+t\,y'.$$

As the moon's motion is here regarded as uniform, the expressions for x and y are more nearly correct the smaller the interval t. The exact values, to be employed in the reduction of an observed occultation, are

$$x=\frac{\sin(\alpha-\alpha')\cos\delta}{\sin\pi}$$

$$y=\frac{\sin(\delta-\delta')\cos^2\tfrac{1}{2}(\alpha-\alpha')+\sin(\delta+\delta')\sin^2\tfrac{1}{2}(\alpha-\alpha')}{\sin\pi}$$

in which α, δ and π are to be taken from the Ephemeris for the time T. But for predicting the times of *immersion* and *emersion*, and the points on the moon's limb where these appearances take place, the preceding expressions suffice to enable the observer to determine when and where to watch for these phenomena.

For the place of observation, let

φ=its latitude, + when north;

λ=its longitude from Washington, + when west;

(*Bessel.*) $\log e=8.9122\ 05$, $\qquad \log(1-e^2)=9.9970\ 916$,

$$\sin\chi=e\sin\varphi, \qquad E=(1-e^2)\sec\chi, \qquad F=\sec\chi.$$

$$\mu'=54147.8\sin 1'', \qquad \log\mu'=9.41916.$$

The constants for the place, required both in the prediction of occultations and the reduction of those observed, are φ, λ, and $E\sin\varphi$, $F\cos\varphi$, $\mu'\,F\cos\varphi$, or their logarithms.

The values of E and F and their logarithms are given for different latitudes in the following table:

φ	E.	F.	Log E.	Log F.
0°	1—.0067	1.0000	9.9971	0.0000
±10	1—.0066	1.0000	9.9971	0.0000
20	1—.0063	1.0004	9.9973	0.0002
30	1—.0059	1.0008	9.9975	0.0004
40	1—.0053	1.0014	9.9977	0.0006
50	1—.0047	1.0020	9.9979	0.0009
60	1—.0042	1.0025	9.9982	0.0011
70	1—.0037	1.0030	9.9984	0.0013
80	1—.0034	1.0033	9.9985	0.0014
90	1—.0033	1.0034	9.9985	0.0014

An occultation will not be visible unless,

1. The latitude of the place is included within the limiting parallels;
2. At the time of occultation, or the local mean time ($T-\lambda$), the sun is sufficiently below the horizon;

3. At that time the star is above the horizon, or its local hour angle $(h - \lambda)$ is numerically less than τ found by the formula

$$\cos \tau = - \tan \varphi \tan \delta',$$

A table of τ, or the hour angle of a body in the horizon, computed for the latitude of the place and different declinations, will be useful for such comparisons.

These conditions can generally be determined in advance, as in latitudes less than 60° $(☌ - \lambda)$ may be used instead of $(T - \lambda)$ except within two hours of sunrise or sunset; and $(H - \lambda)$ instead of $(h - \lambda)$ except within half an hour of the star's rising or setting. For these exceptional cases, which, however, are not favorable for observation, the time of *apparent* conjunction in right ascension, or some nearer approximation to the time of occultation, can be subsequently employed.

Having ascertained that an occultation will be visible, we may proceed to compute the times of immersion and emersion by the following formulæ:

1. To find approximately the time* of *apparent* conjunction in right ascension, as affected by parallax;

$$u = F \cos \varphi \sin (H - \lambda)$$
$$u' = \mu' F \cos \varphi \cos (H - \lambda)$$

In *hours*, $$(t) = \frac{u}{x' - u'}$$

Washington time of *apparent* conjunction, $(T) = ☌ + (t)$

Local " " " $(T) - \lambda$

The value of (T) to the nearest tenth of an hour is sufficiently accurate. If a closer approximation is desired, the computation may be repeated, using $h = H + (\mu)$ instead of H, (μ) being the sidereal equivalent of (t),

$$x = (t)\, x' \qquad (t') = - \frac{x - u}{x' - u'} \qquad (T') = (T) + (t').$$

2. To find a nearer approach to the time of either phase, let us assume the Washington mean time T, which for the first computation may be the computed time of *apparent* conjunction, or some conjectural time near it. For this time find

$$t = T - ☌ \qquad h = H + \mu, \text{ or } h - \lambda = H - \lambda + \mu$$
$$x = t\, x' \qquad y = Y + t\, y',$$

and then T_1 and T_2, the approximate Washington mean times of immersion and emersion, by the following formulæ. The local mean times will be found by subtracting from T_1 and T_2 the longitude of the place.

$$A \sin B = E \sin \varphi \qquad u = F \cos \varphi \sin (h - \lambda) \qquad u' = \mu' A \cos B$$
$$A \cos B = F \cos \varphi \cos (h - \lambda)\dagger \qquad v = A \sin (B - \delta') \qquad v' = \mu' u \sin \delta'$$

[or, with other auxiliaries than A and B,

$$b = F \cos \varphi \cos (h - \lambda) \qquad u' = b\, \mu' \qquad v' = E \sin \varphi \cos \delta' - b \sin \delta']$$

$$m \sin M = x - u \qquad n \sin N = x' - u'$$
$$m \cos M = y - v \qquad n \cos N = y' - v'$$

Burckhardt. $k = .27227$ $\log k = 9.43500$

$$\cos \psi = \frac{m \sin\ M - N}{k} \qquad \psi < 180°$$

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[*] It is convenient, but not necessary, to have this time.

[†] If $(h - \lambda)$ be restricted to values numerically less than 12^h, or 180°, B may be taken in the same quadrant with $(h - \lambda)$, and have the same sign as the latitude. For a place where many occultations are observed, tables of A, B, u and u' for different values of $(h - \lambda)$, or of $E \sin \phi \cos \delta'$ for different declinations, would be convenient.

For *Immersion.* For *Emersion.*

In hours, $t_1 = -\frac{m \cos (M-N)}{n} - \frac{k \sin \psi}{n}$ $t_2 = -\frac{m \cos (M-N)}{n} + \frac{k \sin \psi}{n}$

Washington mean time, $T_1 = T + t_1$ $T_2 = T + t_2$

Local " " $T_1 - \lambda$ $T_2 - \lambda$

3. Assuming now $T_1 = \delta + t + t_1$ for the immersion, or $T_2 = \delta + t + t_2$ for the emersion, as the Washington time instead of T, and recomputing, we can obtain nearer approximation to the times of these phenomena. But the first operation will give the times usually within one or two minutes, which is sufficiently accurate for watching for an immersion. For an emersion a more accurate knowledge is desirable. But for this purpose it will often be sufficient to substitute $(h_2 - \lambda) = (h - \lambda + \frac{1}{2} \mu_2)$ for $(h - \lambda)$ in the computation of u' and v', and, using the same m and M as before, recompute n, N, ψ and t_2, a new correction to be added to T.

If log. $m \sin (M-N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\cos \psi < 1$, or $\cos \psi > 1$. In the latter case the impossible value of $\cos \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the Ephemeris of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 0°$, or $180°$, according as $m \sin (M-N)$ is $+$ or $-$; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M-N)}{n}$$

The distance from the moon's limb is then

$$\pi \, [m \sin (M-N) - k],$$

disregarding the sign of $m \sin (M-N)$; or, allowing for the augmentation of the semidiameter,

$$\pi \, [m \sin (M-N) - k] \, [1 + z \sin \pi],$$

where

$$z = A \cos (B - \delta').$$

4. Having found satisfactorily the times of immersion and emersion, and therefore N and ψ in each case, we have as the angle from the *North point* of the moon's limb, positive towards the *West*,

$$Q = 90° - N - \psi \qquad \text{for an } \textit{Immersion},$$

$$Q = 90° - N + \psi \qquad \text{for an } \textit{Emersion};$$

and, taking

$$c \sin C = u + t u'$$

$$c \cos C = v + t v',$$

in which the last value of t for the particular phase is properly used, we have as the angle from the *Vertex* of the moon's limb, or that point which is nearest the zenith,

$$V = Q + C$$

also reckoned positive in the same direction as Q, i. e., towards the left.

For the image as seen through an inverting telescope, these angles should be increased by 180°.

5. As a check on the accuracy of the work, we have, using the last computed values of the several quantities,

$$[(x-u) + t(x'-u')]^2 + [(y-v) + t(y'-v')]^2 = k^2 = 0.07413;$$

Or, we may compute u, v, x, and y, with the last determined time of immersion, or of emersion, and we should have for either, as the condition of the phenomenon,

$$(x-u)^2 + (y-v)^2 = k^2 = 0.07413$$

or,

$$\log m = \log k = 9.4350$$

Greater values than these indicate that the computed time of an immersion is too early, of an emersion too late, by a quantity nearly proportional to the difference.

Example.—It is required to find the times of immersion and emersion of B. A. C. 1709, January 25, 1877, at Conception City, Chili, for which

$$\varphi = -36°\ 49'.5 \qquad \lambda = -0^h\ 15^m.8$$

The data for the computation are given on page 416. We see in advance that ϕ is between the limiting latitudes; that (☌ $-\lambda$), the local time of *geocentric* conjunction, is less than an hour from midnight; and that $(H-\lambda)$ is only two hours and a half from the meridian.

The constants of the place are :

	$\text{l. sin}\ \phi = 9.7777\,n$		$\text{l. cos}\ \phi = 9.9034$		$\log F \cos \phi = 9.9039$
	$\log E = 9.9976$		$\log F = 0.0005$		$\log \mu' = 9.4192$
(1)	$\log E \sin \phi = 9.7753\,n$	(2)	$\log F \cos \phi = 9.9039$	(3)	$\log \mu' F \cos \phi = 9.3231$

From page 416 we have for the time of *geocentric* conjunction :

Washington time,	☌ = Jan. 25, $11^h\ 12.4^m$	$Y = -.8002$	$\delta' = +29\ 5.4$
Local time,	☌ $-\lambda =$ " 25, $11\ 28.2$	$x' = +.6064$	$\text{l. sin}\ \delta'$ 9.6868
	$H = +2\ 12.6$	$y' = +.0303$	
	$H-\lambda = +2\ 28.4 = +37°\ 6'$		

1. For an approximation to the time of *apparent* conjunction, we have :

(2)	$\log F \cos \phi = 9.904$	(3)	$\log \mu' F \cos \phi = 9.323$	$x' = +.606$
(4)	$\text{l. sin}\,(H-\lambda) = 9.780$	(5)	$\text{l. cos}\,(H-\lambda) = 9.902$	$u' = +.168$
(6)=(2)+(4)	$\log u = 9.684$	(7)=(3)+(5)	$\log u' = 9.225$	$x'-u' = +.438$
(8)	$\log\,(x'-u') = 9.641$			
(6)−(8)	$\log\,(t) = 0.043$		$(t) = +1.10^h =$	$+1^h\ 6.0^m$
			☌ =	$11\ 12.4$

Washington mean time, ... $(T) =$ ☌ $+ (t) =$ Jan. 25, 12 18.4

2. Assuming this time, for which $t = (t) = +1^h\ 6.0^m$, we proceed as follows to find the times of immersion and emersion :

(9)	$t = +1^h\ 6.0^m$, $\mu = +1^h\ 6.2^m$	(27)	$x' = +.6064$		
(10)	$H-\lambda = +2\ 28.4$	(28)	$u' = +.1247$		
(9)+(10)	$h-\lambda = +3\ 34.6 = +53°\ 39'.0$	(29)	$y' = +.0303$		
		(30)	$v' = +.0824$		
(11)	$\text{l. sin}\,(h-\lambda) = 9.9060$	(27)−(28)	$x'-u' = n \sin N = +.4817$		
(12)=(2)	$\log F \cos \phi = 9.9039$	(29)−(30)	$y'-v' = n \cos N = -.0521$		
(13)	$\text{l. cos}\,(h-\lambda) = 9.7728$				
		(31)	$\log m \sin M = 8.3324$		
(14)	$\text{l. sin}\ \delta' = 9.6868$	(32)	$\log m \cos M = 8.1790\,n$		
(11)+(12)	$\log u = 9.8099$; $\text{l.}\ v' = 8.9159$	(33)	$\text{l. tan}\ M = 0.1534\,n$		$M = 125°\ 6'$
(15)	$\log \mu' = 9.4192$; $\text{l.}\ u' = 9.0959$	(34)	$\text{l. sin}\ M = 9.9129$		
(16)=(12)+(13)	$\log A \cos B = 9.6767$				
(17)=(1)	$\log A \sin B = 9.7753\,n$; $B = -51°\ 27'$	(35)	$\log n \sin N = 9.6827$		
(17)−(16)	$\text{l. tan}\ B = 0.0986\,n$; $\delta' = +29\ \ 5$	(36)	$\log n \cos N = 8.7168\,n$		
(18)	$\text{l. sin}\ B = 9.8932\,n$; $B-\delta' = -80\ 32$	(37)	$\text{l. tan}\ N = 0.9659\,n$		$N = 96\ 10$
(19)=(17)−(18)	$\log A = 9.8821$	(38)	$\text{l sin}\ N = 9.9975$		$M-N = 28\ 55$
(20)	$\text{l. sin}\,(B-\delta') = 9.9940\,n$				
(19)+(20)	$\log v = 9.8761\,n$	(39)=(31)−(34)	$\log m = 8.4195$	(39)	$\log m$ 8.4195
(21)	$t x' = +1.10 \times .6064 = x = +.6670$	(40)	*Constant,* $\log \frac{1}{k} = 0.5650$	(42)=(38)−(35)	$\log \frac{1}{n}$ 0.3148
(22)	$u = +.6455$	(41)	$\text{l. sin}\,(M-N) = 9.6844$	(43)	$\text{l cos}\,(M-N)$ 9.9422
(23)	$Y = -.8002$	(39)+(40)+(41)	$\text{l. cos}\ \psi = 8.6689$	(44)	$\log \frac{m}{n} \cos (M-N)$ 8.6765
(24)	$t y' = +1.10 \times .0303 = +.0333$				
(25)=(23)+(24)	$y = -.7669$	(45)	$\psi = +87°\ 20'$	(47)	$\text{l. sin}\ \psi$ 9.9995
(26)	$v = -.7518$	(46)	$90° - N = -\ 6\ 10$	(42)−(40)	$\log \frac{k}{n}$ 9.7498
(21)−(22)	$x-u = m \sin M = +.0215$	(46)−(45)	at Im. $Q_1 = -93\ 30$	(48)	$\log \frac{k}{n} \sin \psi$ 9.7493
(25)−(26)	$y-v = m \cos M = -.0151$	(46)+(45)	at Em. $Q_2 = +81\ 10$		
				(49)	$-\frac{m}{n} \cos (M-N) - 0.047^h$
				(50)	$\frac{k}{n} \sin \psi + 0.561$

	For *Immersion.*	h m		For *Emersion.*	h m
(49)−(50)	$t_1 = -0^{h}.608 =$	$-$ 0 36.5	(49)+(50)	$t_2 = +0^{h}.514 =$	$+$ 0 30.8
	T	= Jan. 25, 12 18.4		T	= Jan. 25, 12 18.4
Washington mean time,	$T_1 = T + t_1$	= " 25, 11 41.9		$T_2 = T + t_2$	= " 25, 12 49.2
	λ	= $-$ 0 15.8		λ	= $-$ 15.8
Local mean time,	$T_1 - \lambda$	= " 25, 11 57.7		$T - \lambda$	= " 25, 13 5.0

3. Assuming these times, for which we have respectively $t + t_1 = +0^{h}\ 29^{m}.5$, and $t + t_2 = +1^{h}\ 36^{m}.8$, and revising the computation, we obtain as a nearer approximation:

		h m		h m
	$t'_1 =$	$+$ 0 0.4	$t'_2 =$	$-$ 0 0.7
Local mean time,	$T' - \lambda =$	Jan. 25, 11 58.1	$T'_2 - \lambda =$	Jan. 25, 13 4.3
Angle from N. Point,	$Q'_1 =$	$-$ 92°.8	$Q'_2 =$	$+$ 80°.9
	$c_1 \sin C_1 = u + t'_1 u' =$	$+$ .5747	$c_2 \sin C_2 = u + t'_2 u' =$	$+$ .7023
	$c_1 \cos C_1 = v + t'_1 v' =$	$-$ .7982	$c_2 \cos C_2 = v + t'_2 v' =$	$-$ .7085
	$C_1 =$	144.2	$C_2 =$	135.3
Angle from Vertex,	$V_1 = Q'_1 + C_1 =$	51.4	$V_2 = Q'_2 + C_2 =$	216.2

We also find for $[(x - u) + t'(x' - u')]^2 + [(y - v) + t'(y' - v')]^2$

At *Immersion,* 0.07410 At *Emersion,* 0.07414

Instead, however, of an entire recomputation, a partial revision may be made, like the following, for correcting the computed time of emersion:

(9)	$\frac{1}{2} t_2 = +15^{m}.4$ $\frac{1}{2} \mu_2 = +0^{h}\ 15^{m}.4$		(27)	$x' = +$	.6064
(10)	$h - \lambda = +3\ 34.6$		(28)	$u' = +$	.1131
(9)+(10)	$h_2 - \lambda = +3\ 50.0 = +57°\ 30'.0$		(29)	$y' = +$	.0303
			(30)	$v' = +$	.0863
(11)	l. sin $(h_2 - \lambda)$	9.9260			
(12)=(2)	$\log F \cos \phi$	9.9039	(27)−(28)	$n \sin N = +$	.4933
(13)	l. cos $(h_2 - \lambda)$	9.7303	(38)=(35)−(36) (29)−(30)	$n \cos N = -$	.0560
(14)	l. sin δ'	9.6868 } l. v' = 8.9359	(35)	$\log n \sin N =$	9.6931
(11)+(12)	$\log u$	9.8299 }	(36)	$\log n \cos N =$	8.7482_n
(15)	$\log \mu'$	9.4192 } l. u' = 9.0534	(37)	l. tan $N =$	0.9449 $N = 96°\ 29'$
(16)=(12)+(13)	$\log A \cos B$	9.6342 }	(38)	l. sin $N =$	9.9972_n $M = 125\ 5$
					$M - N = 28\ 36$
(39)	From 1st Comp. $\log m =$	8.4195	(39)	$\log m =$	8.4195
(40)	*Constant,* $\frac{1}{k} =$	0.5650	(42)=(35)−(38)	$\log \frac{1}{n} =$	0.3041
(41)	l. sin $(M - N) =$	9.6801	(43)	l. cos $(M - N) =$	9.9435
(39)+(40)+(41)	l. cos $\psi =$	8.6646	(44)	$\log \frac{m}{n} \cos (M - N) =$	8.6671
(45)	$\psi = +87°\ 21'$		(47)	l. sin $\psi =$	9.9995
(46)	$90° - N = -\ 6\ 29$		(42)−(40)	$\log \frac{k}{n} =$	9.7391
			(48)	$\log \frac{k}{n} \sin \psi =$	9.7386
(46)+(45)	*Angle from N. point,* $Q_2 = 80\ 52$				
(49)	$-\frac{m}{n} \cos (M - N) = -.046$			$t'_2 = +0^{h}.502 =$	$+$ 0h 30m.1
				T	Jan. 25, 12 18.4
(50)	$\frac{k}{n} \sin \psi = +.548$				
	Washington mean time,			$T'_2 = T + t_2 =$ Jan. 25,	12 48.5
	Local mean time,			$T'_2 - \lambda$ "	13 4.3

Jupiter's Satellites, pages 450–471.—These pages contain for the several Satellites—

1. The Washington mean times of the occultations, eclipses, transits and transits of shadows, arranged in the order of time. Those visible at Washington, or which occur when the sun is more than 8° below and Jupiter more than 8° above the horizon of that place, are indicated by a *.

2. A diagram for each month constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipse for an inverting telescope. The stars indicate the points of disappearance and reappearance, distinguished by *d* and *r*. The space between them shows the position of the shadow of the planet.

3. Washington mean times of geocentric superior conjunctions, arranged for each satellite separately.

4. The rectangular coördinates x' and y' for successive times reckoned from the next preceding superior conjunction, computed for a constant major axis and maximum minor axis of the apparent ellipse described by the satellite as seen from the sun at its mean distance from the planet.

5. The *factors* by which x' and y' are to be multiplied to obtain the actual coördinates x and y for the apparent ellipse, as seen from the earth at any date; the inclination p of the minor axis to the circle of declination, reckoned from the *north*, positive towards the *east;* and the actual coördinates x and y at the times of eclipse of each satellite.

The coördinates are referred to the centre of the primary and to the major and minor axes of the ellipse described by the satellite, and are expressed in seconds of arc. x is positive when on the *east* side of the planet; y is positive when *north*. By means of them the configurations of the satellite can be found at any time.

The *Elements of Saturn's Ring*, page 472, give the *apparent* magnitude and position of its several components for each 20 days. The *apparent Discs of* Venus and Mars are given on the same page for each 30 days.

The *Phenomena*, pages 473 and 474, include the times of conjunction, opposition, and quadrature, perihelion and aphelion, stationary points, and conjunction, with the moon in right ascension, of the principal planets.

The *Positions of the Principal Observatories* are given on pages 475 and 476. The authorities for these positions, and the longitudes with reference to the meridians upon which they actually depend, will be found in the American Ephemeris for 1870, 1871, and 1872.

APPENDIX.

CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1877.

THE Precession of the Equinoxes, the Mean Obliquity of the Ecliptic, and the Constant of Aberration (p. 248) are taken from STRUVE and PETERS. They are:

Precession* $=50''.2411+0''.0002268\,t$,

Obliquity† $=23^\circ\ 27'\ 54''.22-0''.4645\,t-0''.0000014\,t^2$,

Aberration‡ $=20''.4451\pm0''.0111$,

in which t is the number of years after 1800.

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulæ given in his *Numerus Constans Nutationis*, pp. 46–48, and reprinted in the volume of this Ephemeris for 1855. These quantities have been used in all computations relating to the Fixed Stars.

In the Ephemerides of the Sun, Moon and Planets, the Obliquity of the Ecliptic and the Nutation of HANSEN and OLUFSEN's *Tables du Soleil* have been used; but the same Constant of Aberration as for the fixed stars. The Mean Obliquity exceeds that of PETERS by $0''.32$.

The General Constants for Star Reduction are adapted to the formulæ given on page 258. They are computed from the *Tables to facilitate the Reduction of Places of the Fixed Stars, prepared for the use of the American Ephemeris and Nautical Almanac*, Washington, 1869, which have been used in the preparation of previous volumes of this work subsequent to that of 1861.

The Mean Places of the 198 Standard Stars have also been taken from the same tables. Dr. GOULD's *Standard Places of Fundamental Stars, U. S. Coast Survey*, Washington, 1866, is the authority given for 48 Northern Circumpolar Stars and 128 Time Stars; the *British Nautical Almanac* for 1848 for 13 Stars south of -40° declination; and WOLFER's *Tabulæ Reductionum Observationum Astronomicarum*, Berlin, 1858, for Sirius, Castor, (the mean of the components,) Procyon, γ Draconis, and α Cephei. The magnitudes, except of the 13 Southern Stars, are ARGELANDER's.

The reductions from the mean to the apparent places of the Stars contained in WOLFER's *Tabulæ Reductionum*, except α and δ Ursæ Minoris, have been derived from that work; the reductions of the rest from the *Tables of the American Ephemeris*. These reductions include the terms of the formulæ on pages 258 and 485, so far as sensible, except those depending on the moon's longitude. These terms, however, have been applied to the four stars whose places are given for every day. Their values for other stars may readily be found by Tables VI. and VII. of this Appendix.

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* PETERS' *Numerus Constans Nutationis*, p. 71.

† Ibid., pp. 66 and 71.

‡ STRUVE's *Constant de l'Aberration*, p. 47.

APPENDIX.

To the position of Sirius, as derived from Wolfers, (the correction of the "*Tabula Subsidiaria*" being omitted), have been applied the terms given by Auwers,*

$$q=+0^{s}.0647-0^{s}.000718\,(t-1860)+0^{s}.1510\cos\,(u+1^{\circ}\,6')$$
$$r=-0''.630-0''.00044\,(t-1860)+1''.445\,\sin\,(u+23^{\circ}\,30')$$

in which u, the eccentric anomaly from the inferior apsis, is found by the formula

$$u-e\sin u=n\,(t-T),$$

from the elements

$T=1793.830$, passage through the inferior apsis,
$e=\ \ 0.6010$, the eccentricity,
$n=\ \ 7^{\circ}.28475$, mean annual motion in orbit,
$49^{y}.418$, period of revolution.

The Mean Places of such of the Moon-culminating Stars as are not found in the list of standard stars, have been taken in order of preference from the *Almanac Catalogue of Zodiacal Stars printed for the use of the American Ephemeris and Nautical Almanac, Washington*, 1864; *the Greenwich Twelve-Year Catalogue;* and the *Catalogue of the British Association.*

The Ephemeris of the Sun† is constructed from Hansen and Olufsen's *Tables du Soleil*, Copenhagen, 1853, except that Struve's Aberration has been used. This is equivalent to adding 0″.19 to the longitudes, but does not affect the right ascensions and declinations. The Sun's rectangular equatorial coördinates have been computed from the longitudes and latitudes by the following formulæ:

$$X=R\cos\lambda$$
$$Y=R\sin\lambda\cos\omega-19.3\,R\,\beta$$
$$Z=R\sin\lambda\sin\omega+44.5\,R\,\beta$$
$$X'=X+Y\sec\omega\,\varDelta\lambda$$
$$Y'=Y-X\cos\omega\,\varDelta\lambda+Z\,\varDelta\omega-\ 9.4\,\tau\,R\sin(\odot+187^{\circ})$$
$$Z'=Z-X\sin\omega\,\varDelta\lambda-Y\varDelta\omega+21.7\,\tau\,R\sin(\odot+187^{\circ})$$

in which λ, β and ω are referred to the equinox and ecliptic of the date; $\varDelta\lambda$ is the reduction of longitude for precession and nutation from Jan. 0; $\varDelta\omega$ the reduction of the mean to the apparent obliquity; τ the part of the year since Jan. 0; and the numerical coefficients are in units of the 7th place of decimals.

The mean equatorial Horizontal Parallax of the Sun, adopted from Prof. Newcomb's *Investigation of the Distance of the Sun and the Elements which depend on it*,‡ is 8″.848. The adopted Semidiameter of the Sun at the Earth's mean distance is 16′ 2″.

The Ephemeris of the Moon is constructed from Peirce's *Tables of the Moon, 2d edition*, Washington, 1865. They include the *Tables of the Moon's Parallax* constructed from Walker's and Adams's formulæ.

The Semidiameter of the Moon is computed from the Moon's Horizontal Parallax by the formula,

$$S=.272274\,\pi+2''.5.$$

A semidiameter 2″.5 less is found to be better adapted for the computation of eclipses and occultations.

The Ephemeris of Mercury is derived from Prof. Winlock's *Tables of Mercury*, Washington, 1864. They are based on the theory of Le Verrier, published in the Additions to the *Connaissance des Temps* for 1848.

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† From Carlini's Tables before 1858.

‡ *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II

CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Venus is derived from Mr. G. W. HILL's *Tables of Venus*, Washington, 1872.

The Ephemeris of Mars is derived from manuscript Tables constructed from LINDENAU's Tables. Mr. HUGH BREEN's results, contained in his paper *On the Corrections of* LINDENAU's *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0:

$$\begin{aligned}
L &= 320^{\circ}\ 13'\ 33''.87 + 689101''.1527\,t.\\
\pi &= 333\ 23\ 17.84 + 65''.9990\,t.\\
\Omega &= 48\ 25\ 55.29 + 27''.6997\,t.\\
i &= 1\ 51\ 2.20 - 0''.02141\,t.\\
e &= 19238''.75 + 0''.18549\,t.\\
n &= 689050''.8927\\
a &= 1.5236915
\end{aligned}$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from BOUVARD's Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The Ephemeris of Saturn is derived from BOUVARD's Tables. The perturbations produced by Jupiter, and the change of the Great Inequality since 1840, have been increased by $\frac{1}{30}$ of their value. ADAMS's Table in the *British Nautical Almanac* for 1851 has been substituted for BOUVARD's Table XLII. The following corrections of the elements for 1855.0 have also been introduced:

corr. mean long. $= + 4''.9$
corr. long. of node $= - 143''.0$
corr. inclination $= - 5''.7 + 0''.0149\,t.$

The Ephemeris of Uranus is derived from Prof. NEWCOMB's *Tables of Uranus*, Washington, 1873.

The Ephemeris of Neptune is derived from Prof. NEWCOMB's *Tables of Neptune*, Washington, 1866.

The eclipses and elongations of Jupiter's Satellites are computed from DAMOISEAU's Tables.

The semidiameters of the Planets are computed from the following values:

	Semidiameter.	Log Dist.	Authority.
Mercury	$3''.34$	0.00	LE VERRIER, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the mural circle.
Mars (polar)	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Jupiter (equat.)	20.00	0.70	
Saturn (equat.)	9.38	0.95	

The apparent elements of Saturn's Rings are computed from BESSEL's data, except those for Bond's dusky ring.

The Tables for the eclipses of the sun are adapted to the modification of BESSEL's formulæ, suggested by T. HENRY SAFFORD, jr. The formulæ are given in PEIRCE's *Spherical Astronomy* and CHAUVENET's *Spherical and Practical Astronomy*, Vol. I.

APPENDIX.

The elements for occultations of stars by the moon are adapted to BESSEL's method in the *Astronomische Nachrichten*, Vol. VII., and the *Berliner Astronomisches Jahrbuch* for 1831. The formulæ are also to be found in CHAUVENET's *Astronomy.*

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the stereotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner:

The Sun has been computed by Mr. EASTWOOD; the Moon's longitude, latitude, semidiameter and horizontal parallax by Prof. KEITH, right ascension and declination by Prof. VAN VLECK, and culminations by Prof. RUNKLE; the lunar distances by Mr. W. B. OLIVER; Mercury and Venus by Mr. AUSTIN; Mars and Uranus by Mr. FERREL; Jupiter and Jupiter's Satellites by Prof. KENDALL; Saturn by Prof. VAN VLECK; and Neptune by Mr. WIESSNER. The fixed stars have been prepared by Mr. WIESSNER, Mr. LOOMIS and Mr. EASTWOOD; the general constants for their reduction by Mr. HILL; and the occultations by Mr. DOWNES assisted by Mr. WIESSNER. The eclipses have been computed and the charts projected by Mr. HILL. The positions of observatories were compiled by Dr. B. A. GOULD, and revised by him for the volume for 1870.

TABLE I.

TABLE SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Difference of the Proportional Logarithms in the Ephemeris.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

Difference of the Proportional Logarithms in the Ephemeris.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	18
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25	26
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	32

Difference of the Proportional Logarithms in the Ephemeris.

		104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The Correction is to be *added* to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are *decreasing*, and *subtracted* when they are *increasing*.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL

Side-real.	0h.		1h.		2h.		3h.		4h.		5h.		6h.		7h.		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.830	0	19.659	0	29.489	0	39.318	0	49.148	0	58.977	1	8.807		
1	0	0.164	0	9.993	0	19.823	0	29.653	0	39.482	0	49.312	0	59.141	1	8.971	1	0.003
2	0	0.328	0	10.157	0	19.987	0	29.816	0	39.646	0	49.475	0	59.305	1	9.135	2	.005
3	0	0.491	0	10.321	0	20.151	0	29.980	0	39.810	0	49.639	0	59.469	1	9.298	3	.008
4	0	0.655	0	10.485	0	20.314	0	30.144	0	39.974	0	49.803	0	59.633	1	9.462	4	.011
5	0	0.819	0	10.649	0	20.478	0	30.308	0	40.137	0	49.967	0	59.796	1	9.626	5	.014
6	0	0.983	0	10.813	0	20.642	0	30.472	0	40.301	0	50.131	0	59.960	1	9.790	6	.016
7	0	1.147	0	10.976	0	20.806	0	30.635	0	40.465	0	50.295	1	0.124	1	9.954	7	.019
8	0	1.311	0	11.140	0	20.970	0	30.799	0	40.629	0	50.458	1	0.288	1	10.118	8	.022
9	0	1.474	0	11.304	0	21.134	0	30.963	0	40.793	0	50.622	1	0.452	1	10.281	9	.025
10	0	1.638	0	11.468	0	21.297	0	31.127	0	40.956	0	50.786	1	0.616	1	10.445	10	.027
11	0	1.802	0	11.632	0	21.461	0	31.291	0	41.120	0	50.950	1	0.779	1	10.609	11	.030
12	0	1.966	0	11.795	0	21.625	0	31.455	0	41.284	0	51.114	1	0.943	1	10.773	12	.033
13	0	2.130	0	11.959	0	21.789	0	31.618	0	41.448	0	51.278	1	1.107	1	10.937	13	.035
14	0	2.294	0	12.123	0	21.953	0	31.782	0	41.612	0	51.441	1	1.271	1	11.100	14	.038
15	0	2.457	0	12.287	0	22.117	0	31.946	0	41.776	0	51.605	1	1.435	1	11.264	15	.041
16	0	2.621	0	12.451	0	22.280	0	32.110	0	41.939	0	51.769	1	1.599	1	11.428	16	.044
17	0	2.785	0	12.615	0	22.444	0	32.274	0	42.103	0	51.933	1	1.762	1	11.592	17	.046
18	0	2.949	0	12.778	0	22.608	0	32.438	0	42.267	0	52.097	1	1.926	1	11.756	18	.049
19	0	3.113	0	12.942	0	22.772	0	32.601	0	42.431	0	52.260	1	2.090	1	11.920	19	.052
20	0	3.277	0	13.106	0	22.936	0	32.765	0	42.595	0	52.424	1	2.254	1	12.083	20	.055
21	0	3.440	0	13.270	0	23.099	0	32.929	0	42.759	0	52.588	1	2.418	1	12.247	21	.057
22	0	3.604	0	13.434	0	23.263	0	33.093	0	42.922	0	52.752	1	2.582	1	12.411	22	.060
23	0	3.768	0	13.598	0	23.427	0	33.257	0	43.086	0	52.916	1	2.745	1	12.575	23	.063
24	0	3.932	0	13.761	0	23.591	0	33.420	0	43.250	0	53.080	1	2.909	1	12.739	24	.066
25	0	4.096	0	13.925	0	23.755	0	33.584	0	43.414	0	53.243	1	3.073	1	12.903	25	.068
26	0	4.259	0	14.089	0	23.919	0	33.748	0	43.578	0	53.407	1	3.237	1	13.066	26	.071
27	0	4.423	0	14.253	0	24.082	0	33.912	0	43.742	0	53.571	1	3.401	1	13.230	27	.074
28	0	4.587	0	14.417	0	24.246	0	34.076	0	43.905	0	53.735	1	3.564	1	13.394	28	.076
29	0	4.751	0	14.581	0	24.410	0	34.240	0	44.069	0	53.899	1	3.728	1	13.558	29	.079
30	0	4.915	0	14.744	0	24.574	0	34.403	0	44.233	0	54.063	1	3.892	1	13.722	30	.082
31	0	5.079	0	14.908	0	24.738	0	34.567	0	44.397	0	54.226	1	4.056	1	13.886	31	.085
32	0	5.242	0	15.072	0	24.902	0	34.731	0	44.561	0	54.390	1	4.220	1	14.049	32	.087
33	0	5.406	0	15.236	0	25.065	0	34.895	0	44.724	0	54.554	1	4.384	1	14.213	33	.090
34	0	5.570	0	15.400	0	25.22	0	35.059	0	44.888	0	54.718	1	4.547	1	14.377	34	.093
35	0	5.734	0	15.563	0	25.393	0	35.223	0	45.052	0	54.882	1	4.711	1	14.541	35	.096
36	0	5.898	0	15.727	0	25.557	0	35.386	0	45.216	0	55.046	1	4.875	1	14.705	36	.098
37	0	6.062	0	15.891	0	25.721	0	35.550	0	45.380	0	55.209	1	5.039	1	14.868	37	.101
38	0	6.225	0	16.055	0	25.885	0	35.714	0	45.544	0	55.373	1	5.203	1	15.032	38	.104
39	0	6.389	0	16.219	0	26.048	0	35.878	0	45.707	0	55.537	1	5.367	1	15.196	39	.106
40	0	6.553	0	16.383	0	26.212	0	36.042	0	45.871	0	55.701	1	5.530	1	15.360	40	.109
41	0	6.717	0	16.546	0	26.376	0	36.206	0	46.035	0	55.865	1	5.694	1	15.524	41	.112
42	0	6.881	0	16.710	0	26.540	0	36.369	0	46.199	0	56.028	1	5.858	1	15.688	42	.115
43	0	7.045	0	16.874	0	26.704	0	36.533	0	46.363	0	56.192	1	6.022	1	15.851	43	.117
44	0	7.208	0	17.038	0	26.867	0	36.697	0	46.527	0	56.356	1	6.186	1	16.015	44	.120
45	0	7.372	0	17.202	0	27.031	0	36.861	0	46.690	0	56.520	1	6.350	1	16.179	45	.123
46	0	7.536	0	17.366	0	27.195	0	37.025	0	46.854	0	56.684	1	6.513	1	16.343	46	.126
47	0	7.700	0	17.529	0	27.359	0	37.188	0	47.018	0	56.848	1	6.677	1	16.507	47	.128
48	0	7.864	0	17.693	0	27.523	0	37.352	0	47.182	0	57.011	1	6.841	1	16.671	48	.131
49	0	8.027	0	17.857	0	27.687	0	37.516	0	47.346	0	57.175	1	7.005	1	16.834	49	.134
50	0	8.191	0	18.021	0	27.850	0	37.680	0	47.510	0	57.339	1	7.169	1	16.998	50	.137
51	0	8.355	0	18.185	0	28.014	0	37.844	0	47.673	0	57.503	1	7.332	1	17.162	51	.139
52	0	8.519	0	18.349	0	28.178	0	38.008	0	47.837	0	57.667	1	7.496	1	17.326	52	.142
53	0	8.683	0	18.512	0	28.342	0	38.171	0	48.001	0	57.831	1	7.660	1	17.490	53	.145
54	0	8.847	0	18.676	0	28.506	0	38.335	0	48.165	0	57.994	1	7.824	1	17.654	54	.147
55	0	9.010	0	18.840	0	28.670	0	38.499	0	48.329	0	58.158	1	7.988	1	17.817	55	.150
56	0	9.174	0	19.004	0	28.833	0	38.663	0	48.492	0	58.322	1	8.152	1	17.981	56	.153
57	0	9.338	0	19.168	0	28.997	0	38.827	0	48.656	0	58.486	1	8.315	1	18.145	57	.156
58	0	9.502	0	19.331	0	29.161	0	38.991	0	48.820	0	58.650	1	8.479	1	18.309	58	.158
59	0	9.666	0	19.495	0	29.325	0	39.154	0	48.984	0	58.814	1	8.643	1	18.473	59	0.161

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443		
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.38
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.41
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.225	2 30.065	16	.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 39.720	20	.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	.101
38	1 24.862	1 34.691	1 44.521	1 54.531	2 4.180	2 14.010	2 23.839	2 33.669	38	.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24 658	2 34.488	43	.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5 655	2 15-484	2 25.314	2 35.143	47	.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 36.109	59	0.161

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080		
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	.156
58	2 46.755	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0h.		1h.		2h.		3h.		4h.		5h.		6h.		7h.		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.856	0	19.713	0	29.569	0	39.426	0	49.282	0	59.139	1	8.995		
1	0	0.164	0	10.021	0	19.877	0	29.734	0	39.590	0	49.447	0	59.303	1	9.160	1	0.003
2	0	0.329	0	10.185	0	20.041	0	29.898	0	39.754	0	49.611	0	59.467	1	9.324	2	.005
3	0	0.493	0	10.349	0	20.206	0	30.062	0	39.919	0	49.775	0	59.632	1	9.488	3	.008
4	0	0.657	0	10.514	0	20.370	0	30.227	0	40.083	0	49.939	0	59.796	1	9.652	4	.011
5	0	0.821	0	10.678	0	20.534	0	30.391	0	40.247	0	50.104	0	59.960	1	9.817	5	.014
6	0	0.986	0	10.842	0	20.699	0	30.555	0	40.412	0	50.268	1	0.124	1	9.981	6	.016
7	0	1.150	0	11.006	0	20.863	0	30.719	0	40.576	0	50.432	1	0.289	1	10.145	7	.019
8	0	1.314	0	11.171	0	21.027	0	30.884	0	40.740	0	50.597	1	0.453	1	10.310	8	.022
9	0	1.478	0	11.335	0	21.191	0	31.048	0	40.904	0	50.761	1	0.617	1	10.474	9	.025
10	0	1.643	0	11.499	0	21.356	0	31.212	0	41.069	0	50.925	1	0.782	1	10.638	10	.027
11	0	1.807	0	11.663	0	21.520	0	31.376	0	41.233	0	51.089	1	0.946	1	10.802	11	.030
12	0	1.971	0	11.828	0	21.684	0	31.541	0	41.397	0	51.254	1	1.110	1	10.967	12	.033
13	0	2.136	0	11.992	0	21.849	0	31.705	0	41.561	0	51.418	1	1.274	1	11.131	13	.036
14	0	2.300	0	12.156	0	22.013	0	31.869	0	41.726	0	51.582	1	1.439	1	11.295	14	.038
15	0	2.464	0	12.321	0	22.177	0	32.034	0	41.890	0	51.746	1	1.603	1	11.459	15	.041
16	0	2.628	0	12.485	0	22.341	0	32.198	0	42.054	0	51.911	1	1.767	1	11.624	16	.044
17	0	2.793	0	12.649	0	22.506	0	32.362	0	42.219	0	52.075	1	1.932	1	11.788	17	.047
18	0	2.957	0	12.813	0	22.670	0	32.526	0	42.383	0	52.239	1	2.096	1	11.952	18	.049
19	0	3.121	0	12.978	0	22.834	0	32.691	0	42.547	0	52.404	1	2.260	1	12.117	19	.052
20	0	3.285	0	13.142	0	22.998	0	32.855	0	42.711	0	52.568	1	2.424	1	12.281	20	.055
21	0	3.450	0	13.306	0	23.163	0	33.019	0	42.876	0	52.732	1	2.589	1	12.445	21	.057
22	0	3.614	0	13.471	0	23.327	0	33.183	0	43.040	0	52.896	1	2.753	1	12.609	22	.060
23	0	3.778	0	13.635	0	23.491	0	33.348	0	43.204	0	53.061	1	2.917	1	12.774	23	.063
24	0	3.943	0	13.799	0	23.656	0	33.512	0	43.368	0	53.225	1	3.081	1	12.938	24	.066
25	0	4.107	0	13.963	0	23.820	0	33.676	0	43.533	0	53.389	1	3.246	1	13.102	25	.068
26	0	4.271	0	14.128	0	23.984	0	33.841	0	43.697	0	53.554	1	3.410	1	13.266	26	.071
27	0	4.435	0	14.292	0	24.148	0	34.005	0	43.861	0	53.718	1	3.574	1	13.431	27	.074
28	0	4.600	0	14.456	0	24.313	0	34.169	0	44.026	0	53.882	1	3.739	1	13.595	28	.077
29	0	4.764	0	14.620	0	24.477	0	34.333	0	44.190	0	54.046	1	3.903	1	13.759	29	.079
30	0	4.928	0	14.785	0	24.641	0	34.498	0	44.354	0	54.211	1	4.067	1	13.924	30	.082
31	0	5.093	0	14.949	0	24.805	0	34.662	0	44.518	0	54.375	1	4.231	1	14.088	31	.085
32	0	5.257	0	15.113	0	24.970	0	34.826	0	44.683	0	54.539	1	4.396	1	14.252	32	.088
33	0	5.421	0	15.278	0	25.134	0	34.990	0	44.847	0	54.703	1	4.560	1	14.416	33	.090
34	0	5.585	0	15.442	0	25.298	0	35.155	0	45.011	0	54.868	1	4.724	1	14.581	34	.093
35	0	5.750	0	15.606	0	25.463	0	35.319	0	45.176	0	55.032	1	4.888	1	14.745	35	.096
36	0	5.914	0	15.770	0	25.627	0	35.483	0	45.340	0	55.196	1	5.053	1	14.909	36	.099
37	0	6.078	0	15.935	0	25.791	0	35.648	0	45.504	0	55.361	1	5.217	1	15.073	37	.101
38	0	6.242	0	16.099	0	25.955	0	35.812	0	45.668	0	55.525	1	5.381	1	15.238	38	.104
39	0	6.407	0	16.263	0	26.120	0	35.976	0	45.833	0	55.689	1	5.546	1	15.402	39	.107
40	0	6.571	0	16.427	0	26.284	0	36.140	0	45.997	0	55.853	1	5.710	1	15.566	40	.110
41	0	6.735	0	16.592	0	26.448	0	36.305	0	46.161	0	56.018	1	5.874	1	15.731	41	.112
42	0	6.900	0	16.756	0	26.612	0	36.469	0	46.325	0	56.182	1	6.038	1	15.895	42	.115
43	0	7.064	0	16.920	0	26.777	0	36.633	0	46.490	0	56.346	1	6.203	1	16.059	43	.118
44	0	7.228	0	17.085	0	26.941	0	36.798	0	46.654	0	56.510	1	6.367	1	16.223	44	.120
45	0	7.392	0	17.249	0	27.105	0	36.962	0	46.818	0	56.675	1	6.531	1	16.388	45	.123
46	0	7.557	0	17.413	0	27.270	0	37.126	0	46.983	0	56.839	1	6.695	1	16.552	46	.126
47	0	7.721	0	17.577	0	27.434	0	37.290	0	47.147	0	57.003	1	6.860	1	16.716	47	.129
48	0	7.885	0	17.742	0	27.598	0	37.455	0	47.311	0	57.168	1	7.024	1	16.881	48	.131
49	0	8.049	0	17.906	0	27.762	0	37.619	0	47.475	0	57.332	1	7.188	1	17.045	49	.134
50	0	8.214	0	18.070	0	27.927	0	37.783	0	47.640	0	57.496	1	7.353	1	17.209	50	.137
51	0	8.378	0	18.234	0	28.091	0	37.947	0	47.804	0	57.660	1	7.517	1	17.373	51	.140
52	0	8.542	0	18.399	0	28.255	0	38.112	0	47.968	0	57.825	1	7.681	1	17.538	52	.142
53	0	8.707	0	18.563	0	28.420	0	38.276	0	48.132	0	57.989	1	7.845	1	17.702	53	.145
54	0	8.871	0	18.727	0	28.584	0	38.440	0	48.297	0	58.153	1	8.010	1	17.866	54	.148
55	0	9.035	0	18.892	0	28.748	0	38.605	0	48.461	0	58.317	1	8.174	1	18.030	55	.151
56	0	9.199	0	19.056	0	28.912	0	38.769	0	48.625	0	58.482	1	8.338	1	18.195	56	.153
57	0	9.364	0	19.220	0	29.077	0	38.933	0	48.790	0	58.646	1	8.502	1	18.359	57	.156
58	0	9.528	0	19.384	0	29.241	0	39.097	0	48.954	0	58.811	1	8.667	1	18.523	58	.159
59	0	9.692	0	19.549	0	29.405	0	39.262	0	49.118	0	58.975	1	8.831	1	18.688	59	0.162

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847		
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	.025
10	1 20.495	1 30.351	1 40.207	1 50 064	1 59.920	2 9.777	2 19.633	2 29.490	10	.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	.033
13	1 20 987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12 570	2 22.426	2 32.283	27	.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	.096
36	1 24.766	1 34.622	1 44.479	1 54 335	2 4.192	2 14.048	2 23.905	2 33.761	36	.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	.134
50	1 27 066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36 389	52	.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699		
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

TABLE IV.

TABLE GIVING THE CORRECTIONS OF *A* AND *B* WHICH DEPEND ON THE ARGUMENTS 2☾, AND ☾—Γ′.

In units of the *fifth* decimal for *A*, and of the *fourth* for *B*.

Arg. (2☾)	*A*☾	*B*☾	Arg. (2☾)	*A*☾	*B*☾	Arg. (2☾)	*A*☾	*B*☾	Arg. (☾—Γ′)	*A*′☾
d			d			d			d	
0.0	— 0	—886	4.6	—347	+459	9.2	+359	+410	0	+ 0
0.1	19	885	4.7	337	493	9.3	367	374	1	30
0.2	37	882	4.8	326	526	9.4	374	335	2	59
0.3	55	877	4.9	314	558	9.5	381	298	3	85
0.4	74	870	5.0	302	589	9.6	387	259	4	106
0.5	92	862	5.1	289	619	9.7	392	221	5	122
0.6	111	852	5.2	277	648	9.8	396	180	6	132
0.7	128	841	5.3	263	675	9.9	400	140	7	135
0.8	145	827	5.4	248	701	10.0	403	101	8	130
0.9	163	811	5.5	232	725	10.1	404	59	9	119
1.0	180	793	5.6	217	748	10.2	405	+ 19	10	102
1.1	196	775	5.7	201	769	10.3	405	— 22	11	80
1.2	212	754	5.8	185	788	10.4	404	62	12	53
1.3	228	732	5.9	168	806	10.5	402	103	13	+ 23
1.4	243	707	6.0	151	822	10.6	400	143	14	— 7
1.5	258	682	6.1	133	837	10.7	396	183	15	37
1.6	272	657	6.2	116	849	10.8	392	224	16	66
1.7	285	628	6.3	98	859	10.9	387	263	17	90
1.8	298	598	6.4	79	868	11.0	380	301	18	110
1.9	310	569	6.5	61	875	11.1	374	338	19	125
2.0	322	537	6.6	42	881	11.2	367	376	20	134
2.1	333	503	6.7	24	884	11.3	359	412	21	134
2.2	344	470	6.8	— 6	886	11.4	350	449	22	129
2.3	353	435	6.9	+ 13	885	11.5	340	483	23	116
2.4	362	399	7.0	32	883	11.6	329	516	24	97
2.5	370	362	7.1	49	879	11.7	317	549	25	74
2.6	376	324	7.2	68	873	11.8	306	581	26	47
2.7	383	285	7.3	86	865	11.9	293	610	27	— 17
2.8	389	247	7.4	105	855	12.0	281	640	28	+ 13
2.9	394	209	7.5	123	844	12.1	267	667	29	+ 43
3.0	398	169	7.6	140	831	12.2	252	693		
3.1	401	129	7.7	158	815	12.3	237	717		
3.2	403	88	7.8	175	799	12.4	221	741		
3.3	404	46	7.9	191	781	12.5	206	762		
3.4	405	— 6	8.0	207	761	12.6	190	782		
3.5	405	+ 35	8.1	223	738	12.7	174	800		
3.6	404	76	8.2	239	715	12.8	156	817		
3.7	402	116	8.3	254	691	12.9	138	833		
3.8	399	155	8.4	268	665	13.0	121	845		
3.9	395	196	8.5	282	637	13.1	104	856		
4.0	390	235	8.6	294	607	13.2	85	866		
4.1	385	274	8.7	306	578	13.3	67	873		
4.2	378	312	8.8	319	546	13.4	48	879		
4.3	372	350	8.9	330	514	13.5	30	883		
4.4	364	388	9.0	341	480	13.6	+ 11	885		
4.5	—356	+424	9.1	+350	+446	13.7	— 7	—885		

Multiples of the Period of (2☾)

	d
1	13.661
2	27.322
3	40.982

Multiples of the Period of (☾—Γ′)

	d
1	27.55
2	55.11

Arguments. *Washington Mean Noon.*

1877.		Arg. (2☾)	Arg. (☾—Γ′)	1877.		Arg. (2☾)	Arg. (☾—Γ′)
		d	d			d	d
Jan.	0	8.464	27.01	Aug.	0	1.892	18.57
Feb.	0	12.142	2.90	Sept.	0	5.570	22.02
March	0	12.821	3.35	Oct.	0	8.248	24.46
April	0	2.839	6.79	Nov.	0	11.927	0.35
May	0	5.517	9.24	Dec.	0	0.945	2.80
June	0	9.195	12.68	1878.			
July	0	11.874	15.13	Jan.	0	4.623	6.25

Remarks.

To the argument for the beginning of any month, add the day of the month and Washington mean time, and subtract the largest contained multiple of the period.

TABLE V.

TABLE GIVING THE CORRECTIONS OF *A* AND *B* DEPENDING ON THE SMALL TERMS OF THE NUTATION.

WASHINGTON MEAN MIDNIGHT.

1877.	Δ *A*.	Δ *B*.	1877.	Δ *A*.	Δ *B*.	1877.	Δ *A*.	Δ *B*.
Jan. 0	−.00026	−0″.0059	**May** 5	+.00007	−0″.0016	**Sept.** 2	−.00010	+0″.0099
5	25	52	10	07	31	7	− 03	97
10	23	47	15	05	43	12	+ 04	92
15	23	44	20	04	57	17	11	83
20	23	37	25	+ 01	68	22	15	72
25	22	31	30	− 04	78	27	20	60
30	21	25	**June** 4	11	85	**Oct.** 2	22	45
Feb. 4	21	18	9	17	91	7	25	30
9	21	12	14	23	91	12	25	+ 15
14	21	− 05	19	29	89	17	22	− 01
19	21	+ 03	24	34	83	22	21	13
24	19	11	29	39	76	27	19	25
March 1	18	18	**July** 4	44	64	**Nov.** 1	14	34
6	16	27	9	48	49	6	08	41
11	14	33	14	51	34	11	04	45
16	12	37	19	53	− 15	16	+ 01	48
21	10	40	24	53	+ 04	21	− 07	46
26	08	42	29	49	21	26	12	44
31	05	42	**Aug.** 3	46	41	**Dec.** 1	17	38
April 5	− 01	41	8	43	57	6	19	32
10	+ 02	36	13	38	71	11	22	23
15	04	30	18	32	83	16	25	16
20	07	21	23	24	92	21	25	− 07
25	08	+ 10	28	−.00017	+0.0097	26	27	+ 02
30	+.00009	−0.0003				31	−.00028	+0.0009

$$\begin{aligned}\Delta A = {} & +.00025 \sin (2\odot - \Omega) + .00009 \sin (2\Gamma' - \Omega)\\ & +.00010 \sin 2 (\odot - \Gamma') + .00005 \cos \Gamma'\\ & -.00005 \sin 2 (\odot - \Omega) + .00004 \sin 2\Gamma'\\ & -.00011 \sin (3\odot - \Gamma)\end{aligned}$$

$$\begin{aligned}\Delta B = {} & +0''.0067 \cos (2\odot - \Omega)\\ & -0.0027 \cos (3\odot - \Gamma)\\ & +0.0024 \cos (2\Gamma' - \Omega)\\ & -0.0023 \sin \Gamma'\\ & +0.0008 \cos 2\Gamma'\end{aligned}$$

These terms are included in Log. A and Log. B, *f*, G, and Log. *g*, pages 249–257.

TABLE VI.

TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT RIGHT ASCENSIONS WHICH DEPEND ON 2☾ AND ☾ − Γ′.

Hor. Arg. = Star's Right Ascension.

Arg. (2 ☾)	Δa	$\Delta''a$. 0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	Arg. (2 ☾)
d	s	s													d
0.0	-.000	-.0059	-57	-51	-42	-29	-15	-00	+15	+29	+42	+51	+57	+59	0.0
0.5	03	57	59	56	50	39	26	12	+03	18	32	44	52	57	0.5
1.0	05	53	58	58	54	47	37	24	-10	+05	20	34	45	53	1.0
1.5	08	45	53	57	57	53	45	35	22	-07	+07	22	35	45	1.5
2.0	10	36	46	52	55	55	51	43	32	19	-06	+09	23	36	2.0
2.5	11	24	36	45	52	54	54	49	42	31	18	-04	+11	24	2.5
3.0	12	- 11	25	36	45	51	54	53	49	40	30	17	-03	+11	3.0
3.5	12	+ 02	-12	25	37	46	51	54	52	48	39	29	16	-02	3.5
4.0	12	15	+02	-13	26	37	46	52	54	53	48	39	29	15	4.0
4.5	11	28	15	00	14	27	39	48	53	55	53	48	40	28	4.5
5.0	09	39	27	+14	-01	15	29	40	49	55	56	54	48	39	5.0
5.5	07	48	39	26	+12	-02	18	31	42	51	56	57	55	48	5.5
6.0	05	54	48	37	24	+10	-05	21	33	45	53	57	59	54	6.0
6.5	-.002	58	54	47	36	22	+07	-08	23	36	47	55	59	58	6.5
7.0	+.001	59	58	53	45	33	19	+04	-11	25	39	49	56	59	7.0
7.5	04	56	59	57	52	42	30	16	+01	14	28	41	50	56	7.5
8.0	06	51	58	58	55	49	39	28	14	-01	16	30	42	51	8.0
8.5	09	42	51	55	57	54	47	37	25	+11	-03	18	31	42	8.5
9.0	10	32	43	50	55	55	52	45	36	23	+09	-05	20	32	9.0
9.5	12	20	33	43	50	54	54	51	44	34	22	+08	-07	20	9.5
10.0	12	+ 07	21	32	43	50	53	53	50	43	33	21	+07	-07	10.0
10.5	12	- 07	+07	21	33	43	50	53	53	50	43	32	21	+07	10.5
11.0	12	20	-07	+08	22	34	44	51	54	54	50	43	33	20	11.0
11.5	10	32	20	-05	+09	23	36	45	52	55	55	50	43	32	11.5
12.0	09	42	31	18	-03	+11	25	37	47	54	57	55	51	42	12.0
12.5	06	51	43	30	16	-01	14	27	39	49	55	58	58	51	12.5
13.0	04	56	50	41	28	14	+01	16	31	42	52	57	59	56	13.0
13.5	+.001	59	56	49	39	26	-11	+04	19	32	45	53	58	59	13.5
14.0	-.002	-.0058	-59	-55	-47	-36	-23	-08	+07	+22	+36	+46	+54	+58	14.0
		12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	24h	

Arg. (☾ − Γ′)	$\Delta' a$	$\Delta^{4''}a$ 0h 12h	1h 11h	2h 10h	3h 9h	4h 8h	5h 7h	6h 6h
d	s	s						
0	+.000	.0000	+0	+0	+0	+0	+0	+0
1	1	0	1	2	3	4	4	4
2	2	0	2	4	6	7	8	8
3	3	0	3	6	8	10	11	11
4	3	0	4	7	10	12	14	14
5	4	0	4	8	11	14	16	16
6	4	0	5	9	13	15	17	18
7	4	0	5	9	13	16	18	18
8	4	0	4	9	12	15	17	17
9	4	0	4	8	11	14	15	16
10	3	0	3	7	10	12	13	14
11	2	0	3	5	8	9	10	11
12	2	0	2	4	5	6	7	7
13	1	0	+1	+2	+2	+3	+3	+3
14	+.000	.0000	0	0	-1	-1	-1	-1
		12h 24h	13h 23h	14h 22h	15h 21h	16h 20h	17h 19h	18h 18h

Arg. (☾ − Γ′)	$\Delta' a$	$\Delta'''a$ 0h 12h	1h 11h	2h 10h	3h 9h	4h 8h	5h 7h	6h 6h
d	s	s						
14	-.000	.0000	-0	-0	-1	-1	-1	-1
15	1	0	1	2	3	3	4	4
16	2	0	2	4	6	8	9	9
17	3	0	3	6	9	10	12	12
18	3	0	4	7	10	13	14	15
19	4	0	4	8	12	14	16	17
20	4	0	5	9	13	15	17	18
21	4	0	5	9	13	15	17	18
22	4	0	4	9	12	15	17	17
23	4	0	4	8	11	13	15	15
24	3	0	3	7	9	11	13	13
25	2	0	3	5	7	9	10	10
26	1	0	2	3	4	5	6	6
27	1	0	-1	-1	-2	-2	-2	-2
28	-.000	.0000	0	+1	+1	+2	+2	+2
		12h 24h	13h 23h	14h 22h	15h 21h	16h 20h	17h 19h	18h 18h

$\Delta''a$ and $\Delta'''a$ are to be multiplied by tan δ and their signs changed when $a > 12^h$.
The Arguments, (2☾) and (☾ − Γ′), are given in Table IV. for the beginning of each month.

TABLE VII.

TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT DECLINATIONS WHICH DEPEND ON 2 ☾ AND ☾—Γ′.

Hor. Arg. = Star's Right Ascension.

Arg. (2☾)	Δδ													Arg. (2☾)
	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	
d	″	″	″	″	″	″	″	″	″	″	″	″	″	d
0.0	-.00	+.02	+.04	+.06	+.08	+.08	+.09	+.08	+.08	+.06	+.04	+.02	+.00	0.0
0.5	.02	.00	.02	.05	.07	.08	.09	.09	.08	.07	.06	.04	.02	0.5
1.0	.04	-.01	+.01	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	1.0
1.5	.05	.03	-.01	+.01	.03	.05	.07	.08	.09	.08	.08	.07	.05	1.5
2.0	.06	.05	.03	-.01	+.01	.03	.05	.07	.08	.08	.08	.08	.06	2.0
2,5	.07	.06	.05	.03	-.01	+.02	.04	.05	.07	.08	.08	.08	.07	2.5
3.0	.08	.07	.06	.04	.03	.00	+.02	.04	.05	.07	.08	.08	.08	3.0
3.5	.08	.08	.07	.05	.04	-.02	-.01	+.02	.04	.05	.07	.08	.08	3.5
4.0	.08	.08	.08	.07	.06	.04	.02	.00	+.02	.04	.06	.07	.08	4.0
4.5	.07	.08	.08	.08	.08	.06	.05	-.02	.00	+.02	.04	.06	.07	4.5
5.0	.06	.07	.08	.08	.08	.07	.06	.04	-.02	.00	+.02	.04	.06	5.0
5.5	.05	.06	.08	.08	.09	.08	.07	.06	.04	-.02	.00	.03	.05	5.5
6.0	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	-.02	+.01	.03	6.0
6.5	-.01	.03	.05	.07	.08	.09	.09	.08	.07	.05	.03	-.01	+.01	6.5
7.0	+.01	-.02	.04	.06	.07	.08	.09	.09	.08	.07	.05	.03	-.01	7.0
7.5	.02	.00	-.02	.04	.06	.07	.08	.09	.08	.08	.06	.04	.02	7.5
8.0	.04	+.02	.00	-.02	.04	.06	.08	.08	.09	.08	.07	.06	.04	8.0
8.5	.06	.04	+.01	.00	.03	.05	.06	.08	.08	.08	.08	.07	.06	8.5
9.0	.07	.05	.03	+.01	-.01	.03	.05	.06	.08	.08	.08	.08	.07	9.0
9.5	.08	.07	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	.08	.08	9.5
10.0	.08	.08	.06	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	.08	10.0
10.5	.08	.08	.07	.06	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	10.5
11.0	.08	.08	.08	.07	.06	.05	.03	+.01	-.01	.03	.05	.07	.08	11.0
11.5	.07	.08	.08	.08	.07	.06	.05	.03	+.01	-.01	.04	.05	.07	11.5
12.0	.06	.07	.08	.08	.08	.08	.06	.05	.03	+.01	-.02	.04	.06	12.0
12.5	.04	.06	.07	.08	.09	.08	.08	.06	.05	.02	.00	-.02	.04	12.5
13.0	+.02	.05	.06	.08	.09	.09	.08	.08	.06	.04	+.02	.00	-.02	13.0
13,5	.00	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	+.02	.00	13.5
14.0	-.01	+.01	+.03	+.05	+.07	+.08	+.09	+.09	+.08	+.07	+.05	+.03	+.01	14.0
	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	24h	

Arg. (☾—Γ′)	Δ′δ							Arg. (☾—Γ′)	Δ′δ						
	0h 24h	1h 23h	2h 22h	3h 21h	4h 20h	5h 19h	6h 18h		0h 24h	1h 23h	2h 22h	3h 21h	4h 20h	5h 19h	6h 18h
d	″	″	″	″	″	″	″	d	″	″	″	″	″	″	″
0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	0.00	14	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
1	.01	.01	.01	.00	.00	.00	.00	15	.01	.01	.01	.00	.00	.00	.00
2	.01	.01	.01	.01	.01	.00	.00	16	.01	.01	.01	.01	.01	.00	.00
3	.02	.02	.01	.01	.01	.00	.00	17	.02	.02	.02	.01	.01	.00	.00
4	.02	.02	.02	.01	.01	.00	.00	18	.02	.02	.02	.02	.01	.01	.00
5	.02	.02	.02	.02	.01	.01	.00	19	.02	.02	.02	.02	.01	.01	.00
6	.03	.03	.02	.02	.01	.01	.00	20	.03	.03	.02	.02	.01	.01	.00
7	.03	.03	.02	.02	.01	.01	.00	21	.03	.03	.02	.02	.01	.01	.00
8	.03	.02	.02	.02	.01	.01	.00	22	.03	.02	.02	.02	.01	.01	.00
9	.02	.02	.02	.02	.01	.01	.00	23	.02	.02	.02	.02	.01	.01	.00
10	.02	.02	.02	.01	.01	.00	.00	24	.02	.02	.02	.01	.01	.00	.00
11	.02	.02	.01	.01	.01	.00	.00	25	.01	.01	.01	.01	.01	.00	.00
12	.01	.01	.01	.01	.01	.00	.00	26	.01	.01	.01	.01	.00	.00	.00
13	.01	.00	.00	.00	.00	.00	.00	27	.00	.00	.00	.00	.00	.00	.00
14	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	0.00	28	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
	12h 12h	11h 13h	10h 14h	9h 15h	8h 16h	7h 17h	6h 18h		12h 12h	11h 13h	10h 14h	9h 15h	8h 16h	7h 17h	6h 18h

Change the signs of Δδ and Δ′δ when *a* is found at the bottom of the Table.

The Arguments, (2☾) and (☾—Γ′), are given in Table IV. for the beginning of each month.

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

0$^{\text{h}}$, sine + ; **12**$^{\text{h}}$, sine — ; **6**$^{\text{h}}$, cosine — ; **18**$^{\text{h}}$, cosine + } *With minutes in left hand column.*

m	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1$^{\text{m}}$.0	m
0	. . .	6.6398	6.9408	7.1169	7.2419	7.3388	7.4180	7.4849	7.5429	7.5941	7.6398	59
1	7.6398	7.6812	7.7190	7.7538	7.7859	7.8159	7.8439	7.8703	7.8951	7.9186	7.9408	58
2	7.9408	7.9620	7.9822	8.0015	8.0200	8.0377	8.0548	8.0712	8.0870	8.1022	8.1169	57
3	8.1169	8.1312	8.1450	8.1583	8.1713	8.1839	8.1961	8.2080	8.2196	8.2309	8.2419	56
4	.2419	.2526	.2630	.2733	.2832	.2930	.3025	.3119	.3210	.3300	.3388	55
5	.3388	.3474	.3558	.3641	.3722	.3801	.3880	.3956	.4032	.4106	.4179	54
6	8.4179	8.4251	8.4322	8.4391	8.4459	8.4527	8.4593	8.4658	8.4723	8.4786	8.4848	53
7	.4848	.4910	.4971	.5031	.5090	.5148	.5206	.5262	.5318	.5374	.5428	52
8	.5428	.5482	.5535	.5588	.5640	.5691	.5742	.5792	.5842	.5891	.5939	51
9	.5939	.5987	.6035	.6082	.6128	.6174	.6220	.6265	.6309	.6353	.6397	50
10	.6397	.6440	.6483	.6525	.6567	.6609	.6650	.6690	.6731	.6771	.6810	49
11	8.6810	8.6850	8.6889	8.6927	8.6965	8.7003	8.7041	8.7078	8.7115	8.7152	8.7188	48
12	.7188	.7224	.7260	.7295	.7330	.7365	.7400	.7434	.7468	.7502	.7535	47
13	.7535	.7569	.7602	.7634	.7667	.7699	.7731	.7763	.7794	.7826	.7857	46
14	.7857	.7888	.7918	.7949	.7979	.8009	.8039	.8068	.8098	.8127	.8156	45
15	.8156	.8185	.8213	.8242	.8270	.8298	.8326	.8354	.8381	.8409	.8436	44
16	8.8436	8.8463	8.8490	8.8516	8.8543	8.8569	8.8595	8.8621	8.8647	8.8673	8.8699	43
17	.8699	.8724	.8749	.8775	.8799	.8824	.8849	.8874	.8898	.8922	.8946	42
18	.8946	.8970	.9994	.9018	.9042	.9065	.9089	.9112	.9135	.9158	.9181	41
19	.9181	.9203	.9226	.9249	.9271	.9293	.9315	.9337	.9359	.9381	.9403	40
20	.9403	.9425	.9446	.9467	.9489	.9510	.9531	.9552	.9573	.9594	.9614	39
21	8.9614	8.9635	8.9655	8.9676	8.9696	8.9716	8.9736	8.9756	8.9776	8.9796	8.9816	38
22	8.9816	8.9835	8.9855	8.9874	8.9894	8.9913	8.9932	8.9951	8.9970	8.9989	9.0008	37
23	9.0008	9.0027	9.0046	9.0064	9.0083	9.0101	9.0120	9.0138	9.0156	9.0174	9.0192	36
24	.0192	.0210	.0228	.0246	.0264	.0282	.0299	.0317	.0334	.0352	.0369	35
25	.0369	.0386	.0403	.0421	.0438	.0455	.0472	.0488	.0505	.0522	.0539	34
26	9.0539	9.0555	9.0572	9.0588	9.0605	9.0621	9.0637	9.0653	9.0670	9.0686	9.0702	33
27	.0702	.0718	.0734	.0750	.0765	.0781	.0797	.0812	.0828	.0843	.0859	32
28	.0859	.0874	.0890	.0905	.0920	.0935	.0951	.0966	.0981	.0996	.1011	31
29	.1011	.1025	.1040	.1055	.1070	.1084	.1099	.1114	.1128	.1143	.1157	30
30	.1157	.1171	.1186	.1200	.1214	.1228	.1242	.1257	.1271	.1285	.1299	29
31	9.1299	9.1312	9.1326	9.1340	9.1354	9.1368	9.1381	9.1395	9.1409	9.1422	9.1436	28
32	.1436	.1449	.1462	.1476	.1489	.1502	.1516	.1529	.1542	.1555	.1568	27
33	.1568	.1581	.1594	.1607	.1620	.1633	.1646	.1659	.1672	.1684	.1697	26
34	.1697	.1710	.1722	.1735	.1747	.1760	.1772	.1785	.1797	.1810	.1822	25
35	.1822	.1834	.1847	.1859	.1871	.1883	.1895	.1907	.1919	.1931	.1943	24
36	9.1943	9.1955	9 1967	9.1979	9.1991	9.2003	9.2015	9.2026	9.2038	9.2050	9.2061	23
37	.2061	.2073	2085	.2096	.2108	.2119	.2131	.2142	.2153	.2165	.2176	22
38	.2176	.2187	.2199	.2210	.2221	.2232	.2243	.2255	.2266	.2277	.2288	21
39	.2288	.2299	.2310	.2321	.2332	.2343	.2353	.2364	.2375	.2386	.2397	20
40	.2397	.2407	.2418	.2429	.2439	.2450	.2461	.2471	.2482	.2492	.2503	19
41	9.2503	9.2513	9.2524	9.2534	9.2545	9.2555	9.2565	9.2576	9.2586	9.2596	9.2606	18
42	.2606	.2617	.2627	.2637	.2647	.2657	.2667	.2677	.2687	.2697	.2707	17
43	.2707	.2717	.2727	.2737	.2747	.2757	.2767	.2777	.2786	.2796	.2806	16
44	.2806	.2816	.2825	.2835	.2845	.2854	.2864	.2874	.2883	.2893	.2902	15
45	.2902	.2912	.2921	.2931	.2940	.2950	.2959	.2969	.2978	.2987	.2997	14
46	9.2997	9.3006	9.3015	9.3024	9.3034	9.3043	9.3052	9.3061	9.3070	9.3080	9.3089	13
47	.3089	.3098	.3107	.3116	.3125	.3134	.3143	.3152	.3161	.3170	.3179	12
48	.3179	.3188	.3197	.3205	.3214	.3223	.3232	.3241	.3250	.3258	.3267	11
49	.3267	.3276	.3284	.3293	.3302	.3310	.3319	.3328	.3336	.3345	.3353	10
50	.3353	.3362	.3370	.3379	.3387	.3396	.3404	.3413	.3421	.3430	.3438	9
51	9.3438	9.3446	9.3455	9.3463	9.3471	9.3480	9.3488	9.3496	9.3504	9.3513	9.3521	8
52	.3521	.3529	.3537	.3545	.3554	.3562	.3570	.3578	.3586	.3594	.3602	7
53	.3602	.3610	.3618	.3626	.3634	.3642	.3650	.3658	.3666	.3674	.3682	6
54	.3682	.3690	.3698	.3705	.3713	.3721	.3729	.3737	.3745	.3752	.3760	5
55	.3760	.3768	.3775	.3783	.3791	.3799	.3806	.3814	.3822	.3829	.3837	4
56	9.3837	9.3844	9.3852	9.3859	9.3867	9.3875	9.3882	9.3890	9.3897	9.3905	9.3912	3
57	.3912	.3920	.3927	.3934	.3942	.3949	.3957	.3964	.3971	.3979	.3986	2
58	.3986	.3993	.4001	.4008	.4015	.4022	.4030	.4037	.4044	.4051	.4059	1
59	.4059	.4066	.4073	.4080	.4087	.4094	.4102	.4109	.4116	.4123	.4130	0
60	9.4130	9.4137	9.4144	9.4151	9.4158	9.4165	9.4172	9.4179	9.4186	9.4193	9.4200	
	1$^{\text{m}}$.0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	

With minutes in right hand column. } **11**$^{\text{h}}$, sine + ; **23**$^{\text{h}}$, sine — ; **5**$^{\text{h}}$, cosine + ; **17**$^{\text{h}}$ cosine —

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

0^{h}, cosine +; **12**^{h}, cosine —; **6**^{h}, sine +; **18**^{h}, sine — } *With minutes in left hand column.*

m	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1^{m}.0	m
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	59
1	0.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	58
2	0.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	57
3	0.0000	.0000	.0000	.0000	.0000	9·9999	9·9999	9·9999	·99999	9·9999	9·9999	56
4	9·9999	9·9999	9·9999	9·9999	9·9999	·9999	·9999	·9999	·9999	·9999	·9999	55
5	9·9999	9·9999	9·9999	9·9999	9·9999	·9999	·9999	·9999	·9999	·9999	·9999	54
6	9·9999	9·9998	9·9998	9·9998	9·9998	9·9998	9·9998	9·9998	9·9998	9·9998	9·9998	53
7	·9998	·9998	·9998	·9998	·9998	·9998	·9998	·9998	·9997	·9997	·9997	52
8	·9997	·9997	·9997	·9997	·9997	·9997	·9997	·9997	·9997	·9997	·9997	51
9	·9997	·9997	·9996	·9996	·9996	·9996	·9996	·9996	·9996	·9996	·9996	50
10	·9996	·9996	·9996	·9996	·9996	·9995	·9995	·9995	·9995	·9995	·9995	49
11	9·9995	9·9995	9·9995	9·9995	9·9995	9·9995	9·9994	9·9994	9·9994	9·9994	9·9994	48
12	·9994	·9994	·9994	·9994	·9994	·9994	·9993	·9993	·9993	·9993	·9993	47
13	·9993	·9993	·9993	·9993	·9993	·9992	·9992	·9992	·9992	·9992	·9992	46
14	·9992	·9992	·9992	·9992	·9991	·9991	·9991	·9991	·9991	·9991	·9991	45
15	·9991	·9991	·9990	·9990	·9990	·9990	·9990	·9990	·9990	·9990	·9989	44
16	9·9989	9·9989	9·9989	9·9989	9·9989	9·9989	9·9989	9·9988	9·9988	9·9988	9·9988	43
17	·9988	·9988	·9988	·9988	·9987	·9987	·9987	·9987	·9987	·9987	·9987	42
18	·9987	·9986	·9986	·9986	·9986	·9986	·9986	·9986	·9985	·9985	·9985	41
19	·9985	·9985	·9985	·9985	·9984	·9984	·9984	·9984	·9984	·9984	·9983	40
20	·9983	·9983	·9983	·9983	·9983	·9983	·9982	·9982	·9982	·9982	·9982	39
21	9·9982	9·9982	9·9981	9·9981	9·9981	9·9981	9·9981	9·9981	9·9980	9·9980	9·9980	38
22	·9980	·9980	·9980	·9979	·9979	·9979	·9979	·9979	·9978	·9978	·9978	37
23	·9978	·9978	·9978	·9978	·9977	·9977	·9977	·9977	·9977	·9976	·9976	36
24	·9976	·9976	·9976	·9976	·9975	·9975	·9975	·9975	·9975	·9974	·9974	35
25	·9974	·9974	·9974	·9973	·9973	·9973	·9973	·9973	·9972	·9972	·9972	34
26	9·9972	9·9972	9·9972	9·9971	9·9971	9·9971	9·9971	9·9970	9·9970	9·9970	9·9970	33
27	·9970	·9970	·9969	·9969	·9969	·9969	·9968	·9968	·9968	·9968	·9968	32
28	·9968	·9967	·9967	·9967	·9967	·9966	·9966	·9966	·9966	·9965	·9965	31
29	·9965	·9965	·9965	·9964	·9964	·9964	·9964	·9963	·9963	·9963	·9963	30
30	·9963	·9962	·9962	·9962	·9962	·9961	·9961	·9961	·9961	·9960	·9960	29
31	9·9960	9·9960	9·9960	9·9959	9·9959	9·9959	9·9959	9·9958	9·9958	9·9958	9·9958	28
32	·9958	·9957	·9957	·9957	·9956	·9956	·9956	·9956	·9955	·9955	·9955	27
33	·9955	·9955	·9954	·9954	·9954	·9953	·9953	·9953	·9952	·9953	·9952	26
34	·9952	·9952	·9951	·9951	·9951	·9951	·9950	·9950	·9950	·9949	·9949	25
35	·9949	·9949	·9949	·9948	·9948	·9948	·9947	·9947	·9947	·9946	·9946	24
36	9·9946	9·9946	9·9946	9·9945	9·9945	9·9945	9·9944	9·9944	9·9944	9·9943	9·9943	23
37	·9943	·9943	·9943	·9942	·9942	·9942	·9941	·9941	·9941	·9940	·9940	22
38	·9940	·9940	·9939	·9939	·9939	·9938	·9938	·9938	·9937	·9937	·9937	21
39	·9937	·9936	·9936	·9936	·9936	·9935	·9935	·9935	·9934	·9934	·9934	20
40	·9934	·9933	·9933	·9933	·9932	·9932	·9931	·9931	·9931	·9930	·9930	19
41	9·9930	9·9930	9·9929	9·9929	9·9929	9·9928	9·9928	9·9928	9·9927	9·9927	9·9927	18
42	·9927	·9926	·9926	·9926	·9925	·9925	·9925	·9924	·9924	·9923	·9923	17
43	·9923	·9923	·9922	·9922	·9922	·9921	·9921	·9921	·9920	·9920	·9919	16
44	·9919	·9919	·9919	·9918	·9918	·9918	·9917	·9917	·9916	·9916	·9916	15
45	·9916	·9915	·9915	·9915	·9914	·9914	·9913	·9913	·9913	·9912	·9912	14
46	9·9912	9·9912	9·9911	9·9911	9·9910	9·9910	9·9910	9·9909	9·9909	9·9908	9·9908	13
47	·9908	·9908	·9907	·9907	·9906	·9906	·9906	·9905	·9905	·9904	·9904	12
48	·9904	·9904	·9903	·9903	·9902	·9902	·9902	·9901	·9901	·9900	·9900	11
49	·9900	·9900	·9899	·9899	·9898	·9898	·9897	·9897	·9897	·9896	·9896	10
50	·9896	·9895	·9895	·9895	·9894	·9894	·9893	·9893	·9892	·9892	·9892	9
51	9·9892	9·9891	9·9891	9·9890	9·9890	9·9889	9·9889	9·9889	9·9888	9·9888	9·9887	8
52	·9887	·9887	·9886	·9886	·9885	·9885	·9885	·9884	·9884	·9883	·9883	7
53	·9883	·9882	·9882	·9881	·9881	·9881	·9880	·9880	·9879	·9879	·9878	6
54	·9878	·9878	·9877	·9877	·9876	·9876	·9876	·9875	·9875	·9874	·9874	5
55	·9874	·9873	·9873	·9872	·9872	·9871	·9871	·9870	·9870	·9870	·9869	4
56	9·9869	9·9869	9·9868	9·9868	9·9867	9·9867	9·9866	9·9866	9·9865	9·9865	9·9864	3
57	·9864	·9864	·9863	·9863	·9862	·9862	·9861	·9861	·9860	·9860	·9859	2
58	·9859	·9859	·9858	·9858	·9857	·9857	·9856	·9856	·9855	·9855	·9854	1
59	·9854	·9854	·9853	·9853	·9852	·9852	·9851	·9851	·9850	·9850	·9849	0
60	9·9849	9·9849	9·9848	9·9848	9·9847	9·9847	9·9846	9·9846	9·9845	9·9845	9·9844	
	1^{m}.0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	

With minutes in right hand column. { **11**^{h}, cosine —; **23**^{h}, cosine +; **5**^{h}, sine +; **17**^{h}, sine —

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

1^h, sine +; **13^h**, sine —: **7^h**, cosine —; **19^h**, cosine + } *With minutes in left hand column.*

m	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1^m.0	m
0	9.4130	9.4137	9.4144	9.4151	9.4158	9.4165	9.4172	9.4179	9.4186	9.4193	9.4200	59
1	.4200	.4207	.4214	.4221	.4228	.4235	.4242	.4248	.4255	.4262	.4269	58
2	.4269	.4276	.4283	.4289	.4296	.4303	.4310	.4317	.4323	.4330	.4337	57
3	.4337	.4343	.4350	.4357	.4364	.4370	.4377	.4384	.4390	.4397	.4403	56
4	.4403	.4410	.4417	.4423	.4430	.4436	.4443	.4449	.4456	.4462	.4469	55
5	.4469	.4475	.4482	.4488	.4495	.4501	.4508	.4514	.4521	.4527	.4533	54
6	9.4533	9.4540	9.4546	9.4553	9.4559	9.4565	9.4572	9.4578	9.4584	9.4591	9.4597	53
7	.4597	.4603	.4609	.4616	.4622	.4628	.4634	.4641	.4647	.4653	.4659	52
8	.4659	.4666	.4672	.4678	.4684	.4690	.4696	.4703	.4709	.4715	.4721	51
9	.4721	.4727	.4733	.4739	.4745	.4751	.4757	.4763	.4769	.4775	.4781	50
10	.4781	.4787	.4793	.4799	.4805	.4811	.4817	.4823	.4829	.4835	.4841	49
11	9.4841	9.4847	9.4853	9.4859	9.4865	9.4871	9.4876	9.4882	9.4888	9.4894	9.4900	48
12	.4900	.4906	.4911	.4917	.4923	.4929	.4935	.4940	.4946	.4952	.4958	47
13	.4958	.4963	.4969	.4975	.4981	.4986	.4992	.4998	.5003	.5009	.5015	46
14	.5015	.5020	.5026	.5032	.5037	.5043	.5049	.5054	.5060	.5065	.5071	45
15	.5071	.5077	.5082	.5088	.5093	.5099	.5104	.5110	.5115	.5121	.5126	44
16	9.5126	9.5132	9.5137	9.5143	9.5148	9.5154	9.5159	9.5165	9.5170	9.5176	9.5181	43
17	.5181	.5186	.5192	.5197	.5203	.5208	.5213	.5219	.5224	.5230	.5235	42
18	.5235	.5240	.5246	.5251	.5256	.5262	.5267	.5272	.5278	.5283	.5288	41
19	.5288	.5293	.5299	.5304	.5309	.5314	.5320	.5325	.5330	.5335	.5341	40
20	.5341	.5346	.5351	.5356	.5361	.5366	.5372	.5377	.5382	.5387	.5392	39
21	9.5392	9.5397	9.5402	9.5408	9.5413	9.5418	9.5423	9.5428	9.5433	9.5438	9.5443	38
22	.5443	.5448	.5453	.5458	.5463	.5469	.5474	.5479	.5484	.5489	.5494	37
23	.5494	.5499	.5504	.5509	.5514	.5519	.5523	.5528	.5533	.5538	.5543	36
24	.5543	.5548	.5553	.5558	.5563	.5568	.5573	.5578	.5583	.5587	.5592	35
25	.5592	.5597	.5602	.5607	.5612	.5617	.5621	.5626	.5631	.5636	.5641	34
26	9.5641	9.5646	9.5650	9.5655	9.5660	9.5665	9.5670	9.5674	9.5679	9.5684	9.5689	33
27	.5689	.5693	.5698	.5703	.5708	.5712	.5717	.5722	.5726	.5731	.5736	32
28	.5736	.5740	.5745	.5750	.5754	.5759	.5764	.5768	.5773	.5778	.5782	31
29	.5782	.5787	.5792	.5796	.5801	.5805	.5810	.5815	.5819	.5824	.5828	30
30	.5828	.5833	.5838	.5842	.5847	.5851	.5856	.5860	.5865	.5869	.5874	29
31	9.5874	9.5878	9.5883	9.5887	9.5892	9.5896	9.5901	9.5905	9.5910	9.5914	9.5919	28
32	.5919	.5923	.5928	.5932	.5937	.5941	.5945	.5950	.5954	.5959	.5963	27
33	.5963	.5968	.5972	.5976	.5981	.5985	.5990	.5994	.5998	.6003	.6007	26
34	.6007	.6011	.6016	.6020	.6024	.6029	.6033	.6037	.6042	.6046	.6050	25
35	.6050	.6055	.6059	.6063	.6068	.6072	.6076	.6080	.6085	.6089	.6093	24
36	9.6093	9.6097	9.6102	9.6106	9.6110	9.6114	9.6119	9.6123	9.6127	9.6131	9.6135	23
37	.6135	.6140	.6144	.6148	.6152	.6156	.6161	.6165	.6169	.6173	.6177	22
38	.6177	.6181	.6186	.6190	.6194	.6198	.6202	.6206	.6210	.6214	.6219	21
39	.6219	.6223	.6227	.6231	.6235	.6239	.6243	.6247	.6251	.6255	.6259	20
40	.6259	.6264	.6268	.6272	.6276	.6280	.6284	.6288	.6292	.6296	.6300	19
41	9.6300	9.6304	9.6308	9.6312	9.6316	9.6320	9.6324	9.6328	9.6332	9.6336	9.6340	18
42	.6340	.6344	.6348	.6352	.6356	.6360	.6364	.6368	.6371	.6375	.6379	17
43	.6379	.6383	.6387	.6391	.6395	.6399	.6403	.6407	.6411	.6415	.6418	16
44	.6418	.6422	.6426	.6430	.6434	.6438	.6442	.6446	.6449	.6453	.6457	15
45	.6457	.6461	.6465	.6469	.6472	.6476	.6480	.6484	.6488	.6491	.6495	14
46	9.6495	9.6499	9.6503	9.6507	9.6510	9.6514	9.6518	9.6522	9.6526	9.6529	9.6533	13
47	.6533	.6537	.6541	.6544	.6548	.6552	.6556	.6559	.6563	.6567	.6570	12
48	.6570	.6574	.6578	.6582	.6585	.6589	.6593	.6596	.6600	.6604	.6607	11
49	.6607	.6611	.6615	.6618	.6622	.6626	.6629	.6633	.6637	.6640	.6644	10
50	.6644	.6648	.6651	.6655	.6659	.6662	.6666	.6669	.6673	.6677	.6680	9
51	9.6680	9.6684	9.6687	9.6691	9.6695	9.6698	9.6702	9.6705	9.6709	9.6713	9.6716	8
52	.6716	.6720	.6723	.6727	.6730	.6734	.6737	.6741	.6744	.6748	.6752	7
53	.6752	.6755	.6759	.6762	.6766	.6769	.6773	.6776	.6780	.6783	.6787	6
54	.6787	.6790	.6794	.6797	.6801	.6804	.6808	.6811	.6814	.6818	.6821	5
55	.6821	.6825	.6828	.6832	.6835	.6839	.6842	.6845	.6849	.6852	.6856	4
56	9.6856	9.6859	9.6863	9.6866	9.6869	9.6873	9.6876	9.6880	9.6883	9.6886	9.6890	3
57	.6890	.6893	.6896	.6900	.6903	.6906	.6910	.6913	.6917	.6920	.6923	2
58	.6923	.6927	.6930	.6933	.6937	.6940	.6943	.6947	.6950	.6953	.6957	1
59	.6957	.6960	.6963	.6967	.6970	.6973	.6977	.6980	.6983	.6986	.6990	0
60	9.6990	9.6993	9.6996	9.7000	9.7003	9.7006	9.7009	9.7013	9.7016	9.7019	9.7022	
	1^m.0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	

With minutes in right hand column. { **10^h**, sine +; **22^h**, sine —; **4^h**, cosine +; **16^h**, cosine —

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

1^h, cosine +; 13^h, cosine —; 7^h, sine +; 19^h, sine — } *With minutes in left hand column.*

m	·0	·1	·2	·3	·4	·5	·6	·7	·8	·9	1^m·0	m
0	9·9849	9·9849	9·9848	9·9848	9·9847	9·9847	9·9846	9·9846	9·9845	9·9845	9·9844	59
1	·9844	·9844	·9843	·9843	·9842	·9842	·9841	·9841	·9840	·9840	·9839	58
2	·9839	·9839	·9838	·9838	·9837	·9836	·9836	·9835	·9835	·9834	·9834	57
3	·9834	·9833	·9832	·9832	·9832	·9831	·9831	·9830	·9830	·9829	·9828	56
4	·9828	·9828	·9827	·9827	·9826	·9826	·9825	·9825	·9824	·9823	·9823	55
5	·9823	·9822	·9822	·9821	·9821	·9820	·9820	·9819	·9818	·9818	·9817	54
6	9·9817	9·9817	9·9816	9·9816	9·9815	9·9815	9·9814	9·9813	9·9813	9·9812	9·9812	53
7	·9812	·9811	·9811	·9810	·9809	·9809	·9808	·9808	·9807	·9807	·9806	52
8	·9806	·9805	·9805	·9804	·9804	·9803	·9802	·9802	·9801	·9801	·9800	51
9	·9800	·9800	·9799	·9798	·9798	·9797	·9797	·9796	·9795	·9795	·9794	50
10	·9794	·9794	·9793	·9792	·9792	·9791	·9791	·9790	·9789	·9789	·9788	49
11	9·9788	9·9788	9·9787	9·9786	9·9786	9·9785	9·9785	9·9784	9·9783	9·9783	9·9782	48
12	·9782	·9781	·9781	·9780	·9780	·9779	·9778	·9778	·9777	·9776	·9776	47
13	·9776	·9775	·9775	·9774	·9773	·9773	·9772	·9771	·9771	·9770	·9770	46
14	·9770	·9769	·9768	·9768	·9767	·9766	·9766	·9765	·9764	·9764	·9763	45
15	·9763	·9763	·9762	·9761	·9761	·9760	·9759	·9759	·9758	·9757	·9757	44
16	9·9757	9·9756	9·9755	9·9755	9·9754	9·9753	9·9753	9·9752	9·9751	9·9751	9·9750	43
17	·9750	·9749	·9749	·9748	·9747	·9747	·9746	·9745	·9745	·9744	·9743	42
18	·9743	·9743	·9742	·9741	·9741	·9740	·9739	·9739	·9738	·9737	·9737	41
19	·9737	·9736	·9735	·9735	·9734	·9733	·9733	·9732	·9731	·9731	·9730	40
20	·9730	·9729	·9728	·9728	·9727	·9726	·9726	·9725	·9724	·9724	·9723	39
21	9·9723	9·9722	9·9722	9·9721	9·9720	9·9719	9·9719	9·9718	9·9717	9·9717	9·9716	38
22	·9716	·9715	·9714	·9714	·9713	·9712	·9712	·9711	·9710	·9709	·9709	37
23	·9709	·9708	·9707	·9707	·9706	·9705	·9704	·9704	·9703	·9702	·9702	36
24	·9702	·9701	·9700	·9699	·9699	·9698	·9697	·9696	·9696	·9695	·9694	35
25	·9694	·9693	·9693	·9692	·9691	·9690	·9690	·9689	·9688	·9688	·9687	34
26	9·9687	9·9686	9·9685	9·9685	9·9684	9·9683	9·9682	9·9682	9·9681	9·9680	9·9679	33
27	·9679	·9679	·9678	·9677	·9676	·9675	·9675	·9674	·9673	·9672	·9672	32
28	·9672	·9671	·9670	·9669	·9669	·9668	·9667	·9666	·9666	·9665	·9664	31
29	·9664	·9663	·9662	·9662	·9661	·9660	·9659	·9659	·9658	·9657	·9656	30
30	·9656	·9655	·9655	·9654	·9653	·9652	·9651	·9651	·9650	·9649	·9648	29
31	9·9648	9·9647	9·9647	9·9646	9·9645	9·9644	9·9643	9·9643	9·9642	9·9641	9·9640	28
32	·9640	·9639	·9639	·9638	·9637	·9636	·9635	·9635	·9634	·9633	·9632	27
33	·9632	·9631	·9631	·9630	·9629	·9628	·9627	·9626	·9626	·9625	·9624	26
34	·9624	·9623	·9622	·9622	·9621	·9620	·9619	·9618	·9617	·9617	·9616	25
35	·9616	·9615	·9614	·9613	·9612	·9612	·9611	·9610	·9609	·9608	·9607	24
36	9·9607	9·9606	9·9606	9·9605	9·9604	9·9603	9·9602	9·9601	9·9601	9·9600	9·9599	23
37	·9599	·9598	·9597	·9596	·9595	·9595	·9594	·9593	·9592	·9591	·9590	22
38	·9590	·9589	·9588	·9588	·9587	·9586	·9585	·9584	·9583	·9582	·9582	21
39	·9582	·9581	·9580	·9579	·9578	·9577	·9576	·9575	·9575	·9574	·9573	20
40	·9573	·9572	·9571	·9570	·9569	·9568	·9567	·9567	·9566	·9565	·9564	19
41	9·9564	9·9563	9·9562	9·9561	9·9560	9·9559	9·9558	9·9558	9·9557	9·9556	9·9555	18
42	·9555	·9554	·9553	·9552	·9551	·9550	·9549	·9549	·9548	·9547	·9546	17
43	·9546	·9545	·9544	·9543	·9542	·9541	·9540	·9539	·9538	·9538	·9537	16
44	·9537	·9536	·9535	·9534	·9533	·9532	·9531	·9530	·9529	·9528	·9527	15
45	·9527	·9526	·9525	·9525	·9524	·9523	·9522	·9521	·9520	·9519	·9518	14
46	9·9518	9·9517	9·9516	9·9515	9·9514	9·9513	9·9512	9·9511	9·9510	9·9509	9·9508	13
47	·9508	·9507	·9506	·9506	·9505	·9504	·9503	·9502	·9501	·9500	·9499	12
48	·9499	·9498	·9497	·9496	·9495	·9494	·9493	·9492	·9491	·9490	·9489	11
49	·9489	·9488	·9487	·9486	·9485	·9484	·9483	·9482	·9481	·9480	·9479	10
50	·9479	·9478	·9477	·9476	·9475	·9474	·9473	·9472	·9471	·9470	·9469	9
51	9·9469	9·9468	9·9467	9·9466	9·9465	9·9464	9·9463	9·9462	9·9461	9·9460	9·9459	8
52	·9459	·9458	·9457	·9456	·9455	·9454	·9453	·9452	·9451	·9450	·9449	7
53	·9449	·9448	·9447	·9446	·9445	·9444	·9443	·9442	·9441	·9440	·9439	6
54	·9439	·9438	·9437	·9436	·9435	·9434	·9433	·9432	·9431	·9430	·9429	5
55	·9429	·9428	·9427	·9426	·9424	·9423	·9422	·9421	·9420	·9419	·9418	4
56	9·9418	9·9417	9·9416	9·9415	9·9414	9·9413	9·9412	9·9411	9·9410	9·9409	9·9408	3
57	·9408	·9407	·9406	·9404	·9403	·9402	·9401	·9400	·9399	·9398	·9397	2
58	·9397	·9396	·9395	·9394	·9393	·9392	·9391	·9389	·9388	·9387	·9386	1
59	·9386	·9385	·9384	·9383	·9382	·9381	·9380	·9379	·9377	·9376	·9375	0
60	9·9375	9·9374	9·9373	9·9372	9·9371	9·9370	9·9369	9·9368	9·9367	9·9365	9·9364	
	1^m·0	·9	·8	·7	·6	·5	·4	·3	·2	·1	·0	

With minutes in right hand column. { 10^h, cosine —; 22^h, cosine +; 4^h, sine +; 16^h, sine —

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

2h, sine +; **14**h, sine —; **8**h, cosine —; **20**h, cosine + } *With minutes in left hand column.*

m	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1m.0	m
0	9.6990	9.6993	9.6996	9.7000	9.7003	9.7006	9.7009	9.7013	9.7016	9.7019	9.7022	59
1	.7022	.7026	.7029	.7032	.7035	.7039	.7042	.7045	.7048	.7051	.7055	58
2	.7055	.7058	.7061	.7064	.7068	.7071	.7074	.7077	.7080	.7084	.7087	57
3	.7087	.7090	.7093	.7096	.7099	.7103	.7106	.7109	.7112	.7115	.7118	56
4	.7118	.7122	.7125	.7128	.7131	.7134	.7137	.7140	.7144	.7147	.7150	55
5	.7150	.7153	.7156	.7159	.7162	.7165	.7168	.7172	.7175	.7178	.7181	54
6	9.7181	9.7184	9.7187	9.7190	9.7193	9.7196	9.7199	9.7204	9.7205	9.7209	9.7212	53
7	.7212	.7215	.7218	.7221	.7224	.7227	.7230	.7233	.7236	.7239	.7242	52
8	.7242	.7245	.7248	.7251	.7254	.7257	.7260	.7263	.7266	.7269	.7272	51
9	.7272	.7275	.7278	.7281	.7284	.7287	.7290	.7293	.7296	.7299	.7302	50
10	.7302	.7305	.7308	.7311	.7314	.7317	.7320	.7323	.7326	.7329	.7332	49
11	9.7332	9.7335	9.7338	9.7341	9.7344	9.7346	9.7349	9.7352	9.7355	9.7358	9.7361	48
12	.7361	.7364	.7367	.7370	.7373	.7376	.7379	.7381	.7384	.7387	.7390	47
13	.7390	.7393	.7396	.7399	.7402	.7405	.7407	.7410	.7413	.7416	.7419	46
14	.7419	.7422	.7425	.7427	.7430	.7433	.7436	.7439	.7442	.7445	.7447	45
15	.7447	.7450	.7453	.7456	.7459	.7462	.7464	.7467	.7470	.7473	.7476	44
16	9.7476	9.7478	9.7481	9.7484	9.7487	9.7490	9.7492	9.7495	9.7498	9.7501	9.7504	43
17	.7504	.7506	.7509	.7512	.7515	.7517	.7520	.7523	.7526	.7529	.7531	42
18	.7531	.7534	.7537	.7540	.7542	.7545	.7548	.7551	.7553	.7556	.7559	41
19	.7559	.7561	.7564	.7567	.7570	.7572	.7575	.7578	.7580	.7583	.7586	40
20	.7586	.7589	.7591	.7594	.7597	.7599	.7602	.7605	.7607	.7610	.7613	39
21	9.7613	9.7616	9.7618	9.7621	9.7624	9.7626	9.7629	9.7632	9.7634	9.7637	9.7640	38
22	.7640	.7642	.7645	.7647	.7650	.7653	.7655	.7658	.7661	.7663	.7666	37
23	.7666	.7669	.7671	.7674	.7676	.7679	.7682	.7684	.7687	.7690	.7692	36
24	.7692	.7695	.7697	.7700	.7703	.7705	.7708	.7710	.7713	.7716	.7718	35
25	.7718	.7721	.7723	.7726	.7728	.7731	.7734	.7736	.7739	.7741	.7744	34
26	9.7744	9.7746	9.7749	9.7752	9.7754	9.7757	9.7759	9.7762	9.7764	9.7767	9.7769	33
27	.7769	.7772	.7774	.7777	.7780	.7782	.7785	.7787	.7790	.7792	.7795	32
28	.7795	.7797	.7800	.7802	.7805	.7807	.7810	.7812	.7815	.7817	.7820	31
29	.7820	.7822	.7825	.7827	.7830	.7832	.7835	.7837	.7840	.7842	.7844	30
30	.7844	.7847	.7849	.7852	.7854	.7857	.7859	.7862	.7864	.7867	.7869	29
31	9.7869	9.7872	9.7874	9.7876	9.7879	9.7881	9.7884	9.7886	9.7889	9.7891	9.7893	28
32	.7893	.7896	.7898	.7901	.7903	.7906	.7908	.7910	.7913	.7915	.7918	27
33	.7918	.7920	.7922	.7925	.7927	.7930	.7932	.7934	.7937	.7939	.7941	26
34	.7941	.7944	.7946	.7949	.7951	.7953	.7956	.7958	.7960	.7963	.7965	25
35	.7965	.7968	.7970	.7972	.7975	.7977	.7979	.7982	.7984	.7986	.7989	24
36	9.7989	9.7991	9.7993	9.7996	9.7998	9.8000	9.8003	9.8005	9.8007	9.8010	9.8012	23
37	.8012	.8014	.8017	.8019	.8021	.8024	.8026	.8028	.8031	.8033	.8035	22
38	.8035	.8037	.8040	.8042	.8044	.8047	.8049	.8051	.8053	.8056	.8058	21
39	.8058	.8060	.8063	.8065	.8067	.8069	.8072	.8074	.8076	.8078	.8081	20
40	.8081	.8083	.8085	.8087	.8090	.8092	.8094	.8096	.8099	.8101	.8103	19
41	9.8103	9.8105	9.8108	9.8110	9.8112	9.8114	9.8117	9.8119	9.8121	9.8123	9.8125	18
42	.8125	.8128	.8130	.8132	.8134	.8137	.8139	.8141	.8143	.8145	.8148	17
43	.8148	.8150	.8152	.8154	.8156	.8159	.8161	.8163	.8165	.8167	.8169	16
44	.8169	.8172	.8174	.8176	.8178	.8180	.8182	.8185	.8187	.8189	.8191	15
45	.8191	.8193	.8195	.8198	.8200	.8202	.8204	.8206	.8208	.8211	.8213	14
46	9.8213	9.8215	9.8217	9.8219	9.8221	9.8223	9.8225	9.8228	9.8230	9.8232	9.8234	13
47	.8234	.8236	.8238	.8240	.8242	.8245	.8247	.8249	.8251	.8253	.8255	12
48	.8255	.8257	.8259	.8261	.8264	.8266	.8268	.8270	.8272	.8274	.8276	11
49	.8276	.8278	.8280	.8282	.8284	.8286	.8289	.8291	.8293	.8295	.8297	10
50	.8297	.8299	.8301	.8303	.8305	.8307	.8309	.8311	.8313	.8315	.8317	9
51	9.8317	9.8319	9.8322	9.8324	9.8326	9.8328	9.8330	9.8332	9.8334	9.8336	9.8338	8
52	.8338	.8340	.8342	.8344	.8346	.8348	.8350	.8352	.8354	.8356	.8358	7
53	.8358	.8360	.8362	.8364	.8366	.8368	.8370	.8372	.8374	.8376	.8378	6
54	.8378	.8380	.8382	.8384	.8386	.8388	.8390	.8392	.8394	.8396	.8398	5
55	.8398	.8400	.8402	.8404	.8406	.8408	.8410	.8412	.8414	.8416	.8418	4
56	9.8418	9.8420	9.8422	9.8424	9.8426	9.8428	9.8429	9.8431	9.8433	9.8435	9.8437	3
57	.8437	.8439	.8441	.8443	.8445	.8447	.8449	.8451	.8453	.8455	.8457	2
58	.8457	.8459	.8460	.8462	.8464	.8466	.8468	.8470	.8472	.8474	.8476	1
59	.8476	.8478	.8480	.8482	.8483	.8485	.8487	.8489	.8491	.8493	.8495	0
60	9.8495	9.8497	9.8499	9.8501	9.8502	9.8504	9.8506	9.8508	9.8510	9.8512	9.8514	
	1m.0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	

With minutes in right hand column. } **9**h, sine +; **21**h, sine —; **3**h, cosine +; **15**h, cosine —

TABLE VIII.

LOGARITHMS OF SINES AND COSINES. *With the argument in time.*

2^{h}, cosine +; **14^{h}**, cosine —; **8^{h}**, sine +; **20^{h}**, sine — } *With minutes in left hand column.*

m	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	$1^{m}.0$	m
0	9.9375	9.9374	9.9373	9.9372	9.9371	9.9370	9.9369	9.9368	9.9367	9.9365	9.9364	59
1	.9364	.9363	.9362	.9361	.9360	.9359	.9358	.9357	.9355	.9354	.9353	58
2	.9353	.9352	.9351	.9350	.9349	.9348	.9346	.9345	.9344	.9343	.9342	57
3	.9342	.9341	.9340	.9339	.9337	.9336	.9335	.9334	.9333	.9332	.9331	56
4	.9331	.9330	.9328	.9327	.9326	.9325	.9324	.9323	.9322	.9320	.9319	55
5	.9319	.9318	.9317	.9316	.9315	.9313	.9312	.9311	.9310	.9309	.9308	54
6	9.9308	9.9306	9.9305	9.9304	9.9303	9.9302	9.9301	9.9300	9.9298	9.9297	9.9296	53
7	.9296	.9295	.9294	.9292	.9291	.9290	.9289	.9288	.9287	.9285	.9284	52
8	.9284	.9283	.9282	.9281	.9279	.9278	.9277	.9276	.9275	.9274	.9272	51
9	.9272	.9271	.9270	.9269	.9268	.9266	.9265	.9264	.9263	.9261	.9260	50
10	.9260	.9259	.9258	.9257	.9255	.9254	.9253	.9252	.9251	.9249	.9248	49
11	9.9248	9.9247	9.9246	9.9244	9.9243	9.9242	9.9241	9.9240	9.9238	9.9237	9.9236	48
12	.9236	.9235	.9233	.9232	.9231	.9230	.9229	.9227	.9226	.9225	.9224	47
13	.9224	.9222	.9221	.9220	.9219	.9217	.9216	.9215	.9214	.9212	.9211	46
14	.9211	.9210	.9209	.9207	.9206	.9205	.9204	.9202	.9201	.9200	.9198	45
15	.9198	.9197	.9196	.9195	.9193	.9192	.9191	.9190	.9188	.9187	.9186	44
16	9.9186	9.9184	9.9183	9.9182	9.9181	9.9179	9.9178	9.9177	9.9175	9.9174	9.9173	43
17	.9173	.9172	.9170	.9169	.9168	.9166	.9165	.9164	.9163	.9161	.9160	42
18	.9160	.9159	.9157	.9156	.9155	.9153	.9152	.9151	.9149	.9148	.9147	41
19	.9147	.9146	.9144	.9143	.9142	.9140	.9139	.9138	.9136	.9135	.9134	40
20	.9134	.9132	.9131	.9130	.9128	.9127	.9126	.9124	.9123	.9122	.9120	39
21	9.9120	9.9119	9.9118	9.9116	9.9115	9.9114	9.9112	9.9111	9.9110	9.9108	9.9107	38
22	.9107	.9106	.9104	.9103	.9101	.9100	.9099	.9097	.9096	.9095	.9093	37
23	.9093	.9092	.9091	.9089	.9088	.9086	.9085	.9084	.9082	.9081	.9080	36
24	.9080	.9078	.9077	.9075	.9074	.9073	.9071	.9070	.9069	.9067	.9066	35
25	.9066	.9064	.9063	.9062	.9060	.9059	.9057	.9056	.9055	.9053	.9052	34
26	9.9052	9.9050	9.9049	9.9048	9.9046	9.9045	9.9043	9.9042	9.9041	9.9039	9.9038	33
27	.9038	.9036	.9035	.9033	.9032	.9031	.9029	.9028	.9026	.9025	9023	32
28	.9023	.9022	.9021	.9019	.9018	.9016	.9015	.9013	.9012	.9011	9009	31
29	.9009	.9008	.9006	.9005	.9003	.9002	.9000	.8999	.8998	.8996	.8995	30
30	.8995	.8993	.8992	.8990	.8989	.8987	.8986	.8984	.8983	.8982	.8980	29
31	9.8980	9.8979	9.8977	9.8976	9.8974	9.8973	9.8971	9.8970	9.8968	9.8967	9.8965	28
32	.8965	.8964	.8962	.8961	.8959	.8958	.8956	.8955	.8953	.8952	.8950	27
33	.8950	.8949	.8947	.8946	.8944	.8943	.8941	.8940	.8938	.8937	.8935	26
34	.8935	.8934	.8932	.8931	.8929	.8928	.8926	.8925	.8923	.8922	.8920	25
35	.8920	.8919	.8917	.8916	.8914	.8913	.8911	.8910	.8908	.8907	.8905	24
36	9.8905	9.8903	9.8902	9.8900	9.8899	9.8897	9.8896	9.8894	9.8893	9.8891	9.8890	23
37	.8890	.8888	.8887	.8885	.8883	.8882	.8880	.8879	.8877	.8876	.8874	22
38	.8874	.8872	.8871	.8869	.8868	.8866	.8865	.8863	.8862	.8860	.8858	21
39	.8858	.8857	.8855	.8854	.8852	.8850	.8849	.8847	.8846	.8844	.8843	20
40	.8843	.8841	.8839	.8838	.8836	.8835	.8833	.8831	.8830	.8828	.8827	19
41	9.8827	9.8825	9.8823	9.8822	9.8820	9.8819	9.8817	9.8815	9.8814	9.8812	9.8810	18
42	.8810	.8809	.8807	.8806	.8804	.8802	.8801	.8799	.8797	.8796	.8794	17
43	.8794	.8793	.8791	.8789	.8788	.8786	.8784	.8783	.8781	.8779	.8778	16
44	.8778	.8776	.8775	.8773	.8771	.8770	.8768	.8766	.8765	.8763	.8761	15
45	.8761	.8760	.8758	.8756	.8755	.8753	.8751	.8750	.8748	.8746	.8745	14
46	9.8745	9.8743	9.8741	9.8740	9.8738	9.8736	9.8734	9.8733	9.8731	9.8729	9.8728	13
47	.8728	.8726	.8724	.8723	.8721	.8719	.8718	.8716	.8714	.8712	.8711	12
48	.8711	.8709	.8707	.8706	.8704	.8702	.8700	.8699	.8697	.8695	.8694	11
49	.8694	.8692	.8690	.8688	.8687	.8685	.8683	.8682	.8680	.8678	.8676	10
50	.8676	.8675	.8673	.8671	.8669	.8668	.8666	.8664	.8662	.8661	.8659	9
51	9.8659	9.8657	9.8655	9.8654	9.8652	9.8650	9.8648	9.8647	9.8645	9.8643	9.8641	8
52	.8641	.8640	.8638	.8636	.8634	.8632	.8631	.8629	.8627	.8625	.8624	7
53	.8624	.8622	.8620	.8618	.8616	.8615	.8613	.8611	.8609	.8607	.8606	6
54	.8606	.8604	.8602	.8600	.8598	.8597	.8595	.8593	.8591	.8589	.8588	5
55	.8588	.8586	.8584	.8582	.8580	.8578	.8577	.8575	.8573	.8571	.8569	4
56	9.8569	9.8568	9.8566	9.8564	9.8562	9.8560	9.8558	9.8556	9.8555	9.8553	9.8551	3
57	.8551	.8549	.8547	.8545	.8544	.8542	.8540	.8538	.8536	.8534	.8532	2
58	.8532	.8531	.8529	.8527	.8525	.8523	.8521	.8519	.8517	.8516	.8514	1
59	.8514	.8512	.8510	.8508	.8506	.8504	.8502	.8501	.8499	.8497	.8495	0
60	9.8495	9.8493	9.8491	9.8489	9.8487	9.8485	9.8483	9.8482	9.8480	9.8478	9.8476	
	$1^{m}.0$	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	

With minutes in right hand column. } **9^{h}**, cosine —; **21^{h}**, cosine +; **3^{h}**, sine +; **15^{h}**, sine —

URANUS, 1873–1876.

CORRECTIONS

TO THE

AMERICAN EPHEMERIS AND NAUTICAL ALMANAC,

Derived from NEWCOMB'S *Tables.*

WASHINGTON MEAN NOON.

Date.	Δα	Δδ
	s	″
1873, Aug. 27	+1.05	−15.7
Sept. 6	1.08	15.9
16	1.10	16.0
26	1.11	16 2
Oct. 6	1.13	16.4
16	1.14	16 6
26	1.15	16.8
Nov. 5	1.16	17 0
15	1.17	17.2
25	1.17	17.3
Dec. 5	1.17	17.4
15	1 16	17.4
25	1.14	17.3
1874, Jan. 4	1.11	17.2
14	1.08	17.1
24	1.05	17.0
Feb. 3	1.01	16.9
13	0.98	16.7
23	.95	16.5
Mar. 5	.91	16.2
15	.88	15.9
25	.84	15.6
April 4	.81	15.4
14	.78	15.2
24	.76	15.1
May 4	.75	15.0
14	.74	14 9
24	.74	14.9
June 3	.75	14.8
13	.76	14.8
23	.78	14.8
July 3	.79	14.9
13	.81	14.9
23	.83	15.0
Aug. 2	.85	15.1
12	+0.88	−15.2

Date.	Δα	Δδ
	s	″
1874, Aug. 22	+0.90	−15.3
Sept. 1	.93	15.4
11	.95	15.6
21	0.97	15.8
Oct. 1	1.00	15.9
11	1.02	16.1
21	1.04	16.2
31	1.05	16.4
Nov. 10	1.05	16.5
20	1.04	16.6
30	1.03	16.8
Dec. 10	1.02	16.9
20	1.00	16.9
30	0.98	16.9
1875, Jan. 9	.95	16.8
19	.92	16.7
29	.88	16.5
Feb. 8	.85	16.3
18	.82	16.1
28	.78	15.8
Mar. 10	.74	15.5
20	.69	15.2
30	.65	15.0
April 9	.62	14.8
19	.59	14.7
29	.58	14.5
May 9	.58	14.3
19	.59	14.2
29	.61	14.2
June 8	.63	14.1
18	.65	14.1
28	.67	14.1
July 8	.69	14.2
18	.70	14.3
28	.72	14.4
Aug. 7	+0.74	−14.6

Date.	Δα	Δδ
	s	″
1875, Aug. 17	+0.76	−14.8
27	.79	16.0
Sept. 6	.81	16.2
16	.84	15.5
26	.86	15.7
Oct. 6	.88	16.0
16	.90	16.2
26	.91	16.4
Nov. 5	.92	16 6
15	.93	16.8
25	.93	17.0
Dec. 5	.94	17.1
15	.94	17.2
25	+0.94	−17.1

Date.	Δα
1876.	s
Jan. 1 to Feb. 8	−0.09
Feb. 8 " Mar. 27	.08
Mar. 27 " June 7	.09
June 7 " July 17	.10
July 17 " Aug. 16	.11
Aug. 16 " Sept. 16	.12
Sept. 16 " Oct. 15	.13
Oct. 15 " Nov. 14	.14
Nov. 14 " Dec. 3	.15
Dec. 3 " Dec. 24	.16
Dec. 16 " Dec. 32	−0.17

	Δδ
	″
Jan. 1 to June 7	+ 0.7
June 7 " Aug. 26	0.8
Aug. 26 " Nov. 4	0.9
Nov. 4 " Dec. 14	1.0
Dec. 14 " Dec. 32	+ 1.1

TABLES FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

BY PROF. J. H. C. COFFIN, U. S. N.,

SUPERINTENDENT OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

These tables have been prepared at the request of United States Engineers and others engaged in geographical explorations. The formula,[*] on which they are based, is

$$L = h - p \cos t + \tfrac{1}{2} p^2 \sin 1'' \sin^2 t \tan h$$
$$- \tfrac{1}{3} p^3 \sin^2 1'' \cos t \sin^2 t + \tfrac{1}{8} p^4 \sin^3 1'' \sin^4 t \tan^3 h;$$

in which

L = the latitude of the place, and
h = the true altitude,
p = the polar distance, and
t = the hour angle of the star.

Table A contains for the declination 88° 40′, or $p_0 = 1° 20' = 4800''$, the *first correction*,

$$A = - p_0 \cos t - \tfrac{1}{3} p^3_0 \sin^2 1'' \cos t \sin^2 t:$$

Argument, *the hour angle of the star*, or 24^h — the hour angle.

Table B contains the *second correction*,

$$B = \tfrac{1}{2} p^2_0 \sin 1'' \sin^2 t \tan h + \tfrac{1}{8} p^4_0 \sin^3 1'' \sin^4 t \tan^3 h;$$

Arguments, *the true altitude of the star* and the *hour angle*, or 24^h — the hour angle. This quantity is always *additive*.

Table C contains the *third correction*,

$$C = \tfrac{1}{2} (p^2 - p^2_0) \sin 1'' \sin^2 t \tan h;$$

Arguments, B and *the declination of the star* from 88° 38′ to 88° 40′. This quantity is also *additive* when the declination is less than 88° 40′.

Table D contains the *fourth correction*,

$$- (p - p_0) \cos t - \tfrac{1}{3} (p^3 - p^3_0) \sin^2 1'' \cos t \sin^2 t,$$

Arguments, A and *the declination of the star* from 88° 38′ to 88° 40′. This quantity has the same sign as A, when the declination is less than 88° 40′.

The quantities are given to the nearest 0″.1: a . placed after some of them indicates a doubt between the figure given and the next highest, or that the correct value is 0″.05 greater than that given. Thus, 3″.7 . indicates the actual value 3″.75.

The method of using these tables is as follows:

Reduce the observed altitude of the star to the true altitude, and the noted time of the observation to the sidereal time of the place.

Find from the Almanac the apparent right ascension and declination of the star at the time of observation.[†]

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[*] CHAUVENET'S *Spherical and Practical Astronomy*, Vol. I., p. 256.

[†] If great precision is aimed at, the tables in the Almanac may be interpolated for the hour angle at the prime meridian; *i. e.*, the local hour angle + the longitude. The solar date with which to enter will be one day *later* than the day of observation in the case of a *west* hour angle, which added to the mean time of culmination gives more than 24^h or 1^d; and one day *earlier* in the case of an *east* hour angle, which is numerically greater than the mean time of culmination. In the American Ephemeris the mean time of culmination is given in tenths of a day.

LATITUDE BY ALTITUDES OF POLARIS.

Subtracting the right ascension from the sidereal time will give the star's hour angle *west* or +; subtracting the sidereal time from the right ascension will give the hour angle *east* or —. If more than 12^h, subtract it from 24^h and change the sign.

1. With this hour angle take out the *first correction*, *A*, from Table A, giving to it the sign — when the hour angle is numerically *less* than 6^h; the sign + when the hour angle is *greater* than 6^h.
2. With the hour angle and altitude take out the *second correction*,* *B*, from Table B. The sign of this correction is always +.
3. With *B* and the declination take out the *third correction*, *C*, from Table C, giving it the sign +.
4. With *A* and the declination take out the *fourth correction*, *D*, from Table D, giving it the same sign as that of *A*, the first correction.
5. Combine these corrections with the true altitude according to their signs: the result is the latitude of the place of observation.

When great precision is required it will be necessary to take out the *first* and *second corrections* for each observation separately; otherwise, unless the intervals are great, the mean of the times may be used. The means of these two corrections may always be used for finding the *third* and *fourth corrections;* and these four quantities may be combined with the mean of the altitudes.

If the nearest 10″ suffices for each correction, they may be taken out with the nearest arguments without interpolation; and all but the *first* may be thus taken out when a precision of 3″ is required.

If a precision of 1′ is sufficient for each correction, as is ordinarily the case at sea, an hour angle within 3^m will suffice for Table A; Tables C and D may be neglected, and Table B used only when the altitude exceeds 47°.

Example.—**1877, June 7, $1^h\,16^m\,35^s$ A. M., mean time, in longitude 30° West of Washington, suppose the corrected altitude of Polaris to be 47° 18′ 25″, required the latitude of the place.**

				h	m	s
	Local astronomical mean time	June 6,		13	16	35.0
p. 326	Sidereal time at mean noon of June 6,			5	0	51.0
App'x, Table III,	corresponding to $13^h\,16^m\,35^s$,		+		2	10.9
"	" " to the long. $+2^h\,0^m\,0^s$,		+			19.7
	Local sidereal time,			18	19	56.6
p. 264	*Polaris.* App't Dec. +88° 39′ 7″.4.	App't R. A.		1	13	3.2
		Hour angle,	+	17	6	53.4
	(Hour angle at Washington, $-4^h\,53^m$)	or	—	6	53	6.6

The right ascension and declination are interpolated *back* $4^h\,53^m = 0^d.2$ from these given for June 6.8 or forward $19^h\,7^m = 0^d.8$ from these given for June 5.8.

			°	′	″
Corrected altitude,			47	18	25.0
Table A, corresponding to the hour angle,		*A* = +		18	22.6
" B, " "	altitude and hour angle,	*B* = +			57.3
" C, " "	declination and *B*,	*C* = +			1.3
" D, " "	declination and *A*,	*D* = +			12.1
Latitude,		+	47	37	58.3

*** If the altitude is greater than 60°, this correction may be found by taking that for 45° and multiplying it by the tangent of the altitude; adding, if desirable, the second term in the expression for *B*, viz: $+0''.0076 \sin^4 t \tan^3 h$.**

TABLE A.

FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

A = 1st *Correction*. Argument, *the star's hour angle*, (or 24h — *the star's hour angle*.)

	0h		1h		2h		3h		4h		5h		
m	° ' "	"	° ' "	"	° ' "	"	° ' "	"	° ' "	"	° ' "	"	m
0	-1 20 0.0		-1 17 16.5		-1 9 17.1		-0 56 34.4		-0 40 0.3		-0 20 42.5		60
1	19 59.9	0.1	17 11.0	5.5	9 6.6	10.5	56 19.6	14.8	39 42.2	18.1	20 22.3	20.2	59
2	19 59.8	0.1	17 5.5	5.5	8 56.0	10.6	56 4.7	14.9	39 24.0	18.2	20 2.0	20.3	58
3	19 59.6	0.2	16 59.8	5.7	8 45.3	10.7	55 49.7	15.0	39 5.7	18.3	19 41.7	20.3	57
4	19 59.3	0.3	16 54.1	5.7	8 34.6	10.7	55 34.7	15.0	38 47.4	18.3	19 21.4	20.3	56
5	-1 19 58.9	0.4	-1 16 48.3	5.8	-1 8 23.8	10.8	-0 55 19.6	15.1	-0 38 29.1	18.3	-0 19 1.1	20.3	55
6	19 58.4	0.5	16 42.4	5.9	8 12.9	10.9	55 4.4	15.2	38 10.7	18.4	18 40.7	20.4	54
7	19 57.8	0.6	16 36.4	6.0	8 1.9	11.0	54 49.2	15.2	37 52.2	18.4	18 20.3	20.4	53
8	19 57.1	0.7	16 30.3	6.1	7 50.8	11.1	54 33.9	15.3	37 33.8	18.5	17 59.9	20.4	52
9	19 56.3	0.8	16 24.2	6.1	7 39.7	11.1	54 18.6	15.3	37 15.3	18.5	17 39.5	20.4	51
10	-1 19 55.4	0.9	-1 16 17.9	6.3	-1 7 28.5	11.2	-0 54 3.2	15.4	-0 36 56.7	18.6	-0 17 19.1	20.4	50
11	19 54.5	0.9	16 11.6	6.3	7 17.2	11.3	53 47.7	15.5	36 38.1	18.6	16 58.6	20.5	49
12	19 53.4	1.1	16 5.1	6.5	7 5.8	11.4	53 32.1	15.6	36 19.5	18.6	16 38.1	20.5	48
13	19 52.3	1.1	15 58.6	6.5	6 54.4	11.4	53 16.5	15.6	36 0.8	18.7	16 17.6	20.5	47
14	19 51.0	1.3	15 52.0	6.6	6 42.9	11.5	53 0.9	15.6	35 42.1	18.7	15 57.1	20.5	46
15	-1 19 49.7	1.3	-1 15 45.3	6.7	-1 6 31.3	11.6	-0 52 45.2	15.7	-0 35 23.3	18.8	-0 15 36.6	20.5	45
16	19 48.3	1.4	15 38.6	6.7	6 19.6	11.7	52 29.4	15.8	35 4.5	18.8	15 16.0	20.6	44
17	19 46.8	1.5	15 31.7	6.9	6 7.8	11.8	52 13.6	15.8	34 45.6	18.8	14 55.5	20.5	43
18	19 45.2	1.6	15 24.8	6.9	5 56.0	11.8	51 57.7	15.9	34 26.8	18.9	14 34.9	20.6	42
19	19 43.5	1.7	15 17.7	7.1	5 44.1	11.9	51 41.7	16.0	34 7.8	19.0	14 14.3	20.6	41
20	-1 19 41.7	1.8	-1 15 10.6	7.1	-1 5 32.2	11.9	-0 51 25.7	16.0	-0 33 48.9	18.9	-0 13 53.7	20.6	40
21	19 39.9	1.8	15 3.4	7.2	5 20.1	12.1	51 9.6	16.1	33 29.9	19.0	13 33.0	20.7	39
22	19 37.9	2.0	14 56.1	7.3	5 8.0	12.1	50 53.5	16.1	33 10.8	19.1	13 12.4	20.6	38
23	19 35.9	2.0	14 48.7	7.4	4 55.8	12.2	50 37.3	16.2	32 51.7	19.1	12 51.7	20.7	37
24	19 33.7	2.2	14 41.3	7.4	4 43.5	12.3	50 21.1	16.2	32 32.6	19.1	12 31.0	20.7	36
25	-1 19 31.5	2.2	-1 14 33.7	7.6	-1 4 31.2	12.3	-0 50 4.8	16.3	-0 32 13.5	19.1	-0 12 10.3	20.7	35
26	19 29.1	2.4	14 26.1	7.6	4 18.8	12.4	49 48.4	16.4	31 54.3	19.2	11 49.6	20.7	34
27	19 26.7	2.4	14 18.4	7.7	4 6.3	12.5	49 32.0	16.4	31 35.1	19.2	11 28.9	20.7	33
28	19 24.2	2.5	14 10.6	7.8	3 53.7	12.6	49 15.5	16.5	31 15.8	19.3	11 8.1	20.8	32
29	19 21.6	2.6	14 2.7	7.9	3 41.1	12.6	48 59.0	16.5	30 56.5	19.3	10 47.4	20.7	31
30	-1 19 18.9	2.7	-1 13 54.7	8.0	-1 3 28.4	12.7	-0 48 42.4	16.6	-0 30 37.2	19.3	-0 10 26.6	20.8	30
31	19 16.2	2.7	13 46.7	8.0	3 15.6	12.8	48 25.7	16.7	30 17.8	19.4	10 5.9	20.7	29
32	19 13.3	2.9	13 38.5	8.2	3 2.7	12.9	48 9.0	16.7	29 58.4	19.4	9 45.1	20.8	28
33	19 10.3	3.0	13 30.3	8.2	2 49.8	12.9	47 52.3	16.7	29 38.9	19.5	9 24.3	20.8	27
34	19 7.3	3.0	13 22.0	8.3	2 36.8	13.0	47 35.5	16.8	29 19.5	19.4	9 3.5	20.8	26
35	-1 19 4.1	3.2	-1 13 13.6	8.4	-1 2 23.7	13.1	-0 47 18.6	16.9	-0 29 0.0	19.5	-0 8 42.6	20.9	25
36	19 0.9	3.2	13 5.1	8.5	2 10.6	13.1	47 1.7	16.9	28 40.4	19.6	8 21.8	20.8	24
37	18 57.6	3.3	12 56.6	8.5	1 57.4	13.2	46 44.7	17.0	28 20.9	19.5	8 1.0	20.8	23
38	18 54.2	3.4	12 47.9	8.7	1 44.1	13.3	46 27.7	17.0	28 1.3	19.6	7 40.1	20.9	22
39	18 50.7	3.5	12 39.2	8.7	1 30.7	13.4	46 10.6	17.1	27 41.6	19.7	7 19.3	20.8	21
40	-1 18 47.1	3.6	-1 12 30.4	8.8	-1 1 17.3	13.4	-0 45 53.5	17.1	-0 27 22.0	19.6	-0 6 58.4	20.9	20
41	18 43.4	3.7	12 21.5	8.9	1 3.8	13.5	45 36.3	17.2	27 2.3	19.7	6 37.6	20.8	19
42	18 39.6	3.8	12 12.6	8.9	0 50.2	13.6	45 19.1	17.2	26 42.5	19.8	6 16.7	20.9	18
43	18 35.8	3.8	12 3.5	9.1	0 36.6	13.6	45 1.8	17.3	26 22.8	19.7	5 55.8	20.9	17
44	18 31.8	4.0	11 54.4	9.1	0 22.9	13.7	44 44.5	17.3	26 3.0	19.8	5 34.9	20.9	16
45	-1 18 27.8	4.0	-1 11 45.1	9.3	-1 0 9.1	13.8	-0 44 27.1	17.4	-0 25 43.2	19.8	-0 5 14.0	20.9	15
46	18 23.7	4.1	11 35.8	9.3	-0 59 55.3	13.8	44 9.6	17.5	25 23.3	19.9	4 53.1	20.9	14
47	18 19.5	4.2	11 26.5	9.3	59 41.4	13.9	43 52.1	17.5	25 3.4	19.9	4 32.2	20.9	13
48	18 15.2	4.3	11 17.0	9.5	59 27.4	14.0	43 34.6	17.5	24 43.5	19.9	4 11.3	21.0	12
49	18 10.8	4.4	11 7.4	9.6	59 13.3	14.1	43 17.0	17.6	24 23.6	19.9	3 50.3	20.9	11
50	-1 18 6.3	4.5	-1 10 57.8	9.6	-0 58 59.2	14.1	-0 42 59.4	17.6	-0 24 3.6	20.0	-0 3 29.4	20.9	10
51	18 1.7	4.6	10 48.1	9.7	58 45.0	14.2	42 41.7	17.7	23 43.6	20.0	3 8.5	21.0	9
52	17 57.0	4.7	10 38.3	9.8	58 30.8	14.2	42 23.9	17.8	23 23.6	20.0	2 47.5	20.9	8
53	17 52.3	4.7	10 28.4	9.9	58 16.5	14.3	42 6.1	17.8	23 3.6	20.0	2 26.6	20.9	7
54	17 47.4	4.9	10 18.5	9.9	58 2.1	14.4	41 48.3	17.8	22 43.5	20.1	2 5.7	21.0	6
55	-1 17 42.5	4.9	-1 10 8.5	10.0	-0 57 47.6	14.5	-0 41 30.4	17.9	-0 22 23.4	20.1	-0 1 44.7	20.9	5
56	17 37.5	5.0	9 58.4	10.1	57 33.1	14.5	41 12.5	17.9	22 3.3	20.1	1 23.8	21.0	4
57	17 32.4	5.1	9 48.2	10.2	57 18.5	14.6	40 54.5	18.0	21 43.1	20.2	1 2.8	20.9	3
58	17 27.2	5.2	9 37.9	10.3	57 3.9	14.6	40 36.5	18.0	21 23.0	20.1	0 41.9	21.0	2
59	17 21.9	5.3	9 27.5	10.4	56 49.2	14.7	40 18.4	18.1	21 2.8	20.2	0 20.9	20.9	1
60	-1 17 16.5	5.4	-1 9 17.1	10.4	-0 56 34.4	14.8	-0 40 0.3	18.1	-0 20 42.5	20.3	-0 0 0.0	20.9	0
	11h		10h		9h		8h		7h		6h		

Change the sign to + when the argument is found at the bottom.

TABLE B.

FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

B = *the 2d correction.* This correction is always *additive.*

Star's Hour Angle.	STAR'S ALTITUDE.																				Star's Hour Angle.
	10°		15°		16°		17°		18°		19°		20°		21°		22°		23°		
h m	″		″		″		″		″		″		″		″		″		″		h m
0 0	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		12 0
10	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	0.0	.0	11 50
20	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1·	.1	0.1·	.1	0.2	.2	0.2	.2	0.2	.2	40
30	0.2	.1	0.2·	.1	0.3	.2	0.3	.2	0.3	.2	0.3	.2	0.3·	.2	0.4	.2	0.4	.2	0.4	2	30
40	0.3	.1	0.4·	.2	0.5	.2	0.5	.2	0.5·	.2	0.6	.3	0.6	.3	0.7	.3	0.7	.3	0.7	.3	20
50	0.5	.2	0.7	.3	0.7·	.2	0.8	.3	0.8·	.3	0.9	.3	1.0	.4	1.0	.4	1.0·	.3	1.1	.4	10
1 0	0.7·	.2	1.0	.3	1.1	.3	1.1	.3	1.2	.4	1.3	.4	1.4	.4	1.4	.4	1.5	.5	1.6	.5	0
10	0.9	.2	1.3·	.3	1.4·	.4	1.5	.4	1.6	.4	1.7	.4	1.8	.4	1.9	.5	2.0	.5	2.1	.5	10 50
20	1.1·	.3	1.7·	.4	1.9	.5	2.0	.5	2.1	.5	2.2·	.5	2.4	.6	2.5	.6	2.6	.6	2.8	.7	40
30	1.4	.3	2.2	.5	2.3	.4	2.5	.5	2.7	.6	2.8	.6	3.0	.6	3.1	.6	3.3	.7	3.5	.7	30
40	1.8	.4	2.7	.5	2.9	.6	3.0·	.5	3.2	.5	3.4	.6	3.6	.6	3.8	.7	4.0	.7	4.2	.7	20
50	2.1	.3	3.2	.5	3.4	.5	3.6	.6	3.9	.7	4.1	.7	4.3	.7	4.6	.8	4.8	.8	5.0·	.8	10
2 0	2.5	.4	3.7	.5	4.0	.6	4.3	.7	4.5	.6	4.8	.7	5.1	.8	5.4	.8	5.6	.8	5.9	.9	0
10	2.8	.3	4.3	.6	4.6	.6	4.9	.6	5.2	.7	5.5·	.7	5.9	.8	6.2	.8	6.5	.9	6.8·	.9	9 50
20	3.2	.4	4.9	.6	5.3	.7	5.6	.7	6.0	.8	6.3	.8	6.7	.8	7.0·	.8	7.4	.9	7.8	1.0	40
30	3.6·	.5	5.5	.6	5.9	.6	6.3	.7	6.7	.7	7.1	.8	7.5	.8	7.9·	.9	8.4	1.0	8.8	1.0	30
40	4.1	.5	6.2	.7	6.6	.7	7.0·	.7	7.5	.8	7.9·	.8	8.4	.9	8.9	1.0	9.3	0.9	9.8	1.0	20
50	4.5	.4	6.8	.6	7.3	.7	7.8	.8	8.3	.8	8.8	.9	9.3	.9	9.8	0.9	10.3	1.0	10.8	1.0	10
3 0	4.9	.4	7.5	.7	8.0	.7	8.5	.7	9.1	.8	9.6	.8	10.2	.9	10.7	0.9	11.3	1.0	11.8·	1.0	0
10	5.3·	.4	8.1	.6	8.7	.7	9.3	.8	9.8·	.7	10.4	.8	11.0	.8	11.6	0.9	12.3	1.0	12.9	1.1	8 50
20	5.8	.5	8.8	.7	9.4	.7	10.0	.7	10.6·	.8	11.3	.9	11.9	.9	12.6	1.0	13.2	0.9	13.9	1.0	40
30	6.2	.4	9.4	.6	10.1	.7	10.7·	.7	11.4	.8	12.1	.8	12.8	.9	13.5	0.9	14.2	1.0	14.9	1.0	30
40	6.6	.4	10.0	.6	10.7	.6	11.4·	.7	12.2	[illegible]	12.9	.8	13.6	.8	14.4	.9	15.1·	0.9	15.9	1.0	20
50	7.0	.4	10.6	.6	11.4	.7	12.1	.7	12.9	.7	13.7	.8	14.5	.9	15.2·	.8	16.0·	.9	16.9	1.0	10
4 0	7.4	.4	11.2	.6	12.0	.6	12.8	.7	13.6	.7	14.4	.7	15.3	.8	16.1	.9	16.9	.9	17.8	0.9	0
10	7.7·	.3	11.8	.6	12.6	.6	13.4	.6	14.3	.7	15.1	.7	16.0	.7	16.9	.8	17.7	.8	18.6·	.8	7 50
20	8.1	.4	12.3	.5	13.1·	.6	14.0	.6	14.9	.6	15.8	.7	16.7	.7	17.6	.7	18.5	.8	19.5	.8	40
30	8.4	.3	12.8	.5	13.7	.5	14.6	.6	15.5	.6	16.4	.6	17.3	.6	18.3	.7	19.3	.8	20.2	.7	30
40	8.7	.3	13.2	.4	14.1	.4	15.1	.5	16.0	.5	17.0	.6	17.9·	.6	18.9	.6	19.9	.6	20.9	.7	20
50	9.0	.3	13.6	4	14.6	.5	15.5	.4	16.5	.5	17.5	.5	18.5	.6	19.5	.6	20.5	.6	21.6	.7	10
5 0	9.2	.2	14.0	.4	14.9	.3	15.9	.4	16.9	.4	17.9·	.4	19.0	.5	20.0	.5	21.1	.6	22.1	.5	0
10	9.4	.2	14.3	.3	15.3	.4	16.3	.4	17.3	.4	18.3	.4	19.4	.4	20.4	.4	21.5	.4	22.6	.5	6 50
20	9.6	.2	14.5	.2	15.5	.2	16.6	.3	17.6	.3	18.6·	.3	19.7	.3	20.8	.4	21.9	.4	23.0	.4	40
30	9.7	.1	14.7	.2	15.7	.2	16.8	.2	17.8	.2	18.9	.3	20.0	.3	21.1	.3	22.2	.3	23.3	.3	30
40	9.8	.1	14.8·	.1	15.9	.2	16.9	.1	18.0	.2	19.1	.2	20.2	.2	21.3	.2	22.4	.2	23.5	.2	20
50	9.8	.0	14.9	.1	16.0	.1	17.0	.1	18.1	.1	19.2	.1	20.3	.1	21.4	.1	22.5	.1	23.7	.2	10
6 0	9.8·	.0	15.0	.1	16.0	.0	17.1	.1	18.1	.0	19.2	.0	20.3	.0	21.4	.0	22.6	.1	23.7	.0	6 0

TABLE C.

C = *the 3d correction*, (additive.) Hor. Arg., *the star's declination.* Vert. Arg., *B* = *the 2d correction.*

B	88° 38′						88° 39′						
	0″	10″	20″	30″	40″	50″	0″	10″	20″	30″	40″	50″	60″
″	″	″	″	″	″	″	″	″	″	″	″	″	″
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.5	0.4	0.4	0.4	0.3	0.3	0.2·	0.2	0.2	0.1	0.1	0.0	0.0
20	1.0	0.9	0.8	0.7·	0.7	0.6	0.5	0.4	0.3	0.2·	0.2	0.1	0.0
30	1.5	1.4·	1.3	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.2·	0.1	0.0
40	2.0	1.8	1.7	1.5	1.3	1.2	1.0	0.8	0.7	0.5	0.3	0.2	0.0

NOTE.—Below 15° *B* is nearly proportional to the altitude.

TABLE B—CONTINUED.

FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

B = *the 2d correction.* This correction is always *additive.*

Star's Hour Angle.	STAR'S ALTITUDE.																				Star's Hour Angle.
	24°		25°		26°		27°		28°		29°		30°		31°		32°		33°		
h m	″		″		″		″		″		″		″		″		″		″		h m
0 0	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		12 0
10	0.0·	.0	0.0·	.0	0.0·	.0	0.0·	.0	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	11 50
20	0.2	.2	0.2	.2	0.2	.2	0.2	.2	0.2	.1	0.2	.1	0.2	.1	0.3	.2	0.3	.2	0.3	.2	40
30	0.4	.2	0.4	.2	0.5	.3	0.5	.3	0.5	.3	0.5	.3	0.5·	.3	0.6	.3	0.6	.3	0.6	.3	30
40	0.7·	.3	0.8	.4	0.8	.3	0.9	.4	0.9	.4	0.9	.4	1.0	.5	1.0	.4	1.0·	.4	1.1	.5	20
50	1.2	.5	1.2	.4	1.3	.5	1.3	.4	1.4	.5	1.4	.5	1.5	.5	1.6	.6	1.6	.6	1.7	.6	10
1 0	1.7	.5	1.7	.5	1.8	.5	1.9	.6	2.0	.6	2.1	.7	2.2	.7	2.2·	.6	2.3	.7	2.4	.7	0
10	2.2·	.5	2.3·	.6	2.5	.7	2.6	.7	2.7	.7	2.8	.7	2.9	.7	3.0	.8	3.2	.9	3.3	.9	10 50
20	2.9	.7	3.0	.7	3.2	.7	3.3	.7	3.4	.7	3.6	.8	3.8	.9	3.9	.9	4.1	.9	4.2·	.9	40
30	3.6·	.7	3.8	.8	4.0	.8	4.2	.9	4.3·	.9	4.5	.9	4.7	.9	4.9	1.0	5.1	1.0	5.3	1.1	30
40	4.4·	.8	4.7	.9	4.9	.9	5.1	.9	5.3	1.0	5.5	1.0	5.8	1.1	6.0	1.1	6.2	1.1	6.5	1.2	20
50	5.3	.9	5.6	.9	5.8	.9	6.1	1.0	6.3	1.0	6.6	1.1	6.9	1.1	7.2	1.2	7.4	1.2	7.7	1.2	10
2 0	6.2	.9	6.5	.9	6.8	1.0	7.1	1.0	7.4	1.1	7.7	1.1	8.1	1.2	8.4	1.2	8.7	1.3	9.1	1.4	0
10	7.2	1.0	7.5	1.0	7.9	1.1	8.2	1.1	8.6	1.2	8.9	1.2	9.3	1.2	9.7	1.3	10.1	1.4	10.5	1.4	9 50
20	8.2	1.0	8.6	1.1	9.0	1.1	9.4	1.2	9.8	1.2	10.2	1.3	10.6	1.3	11.0	1.3	11.5	1.4	11.9	1.4	40
30	9.2	1.0	9.7	1.0	10.1	1.1	10.5·	1.2	11.0	1.2	11.5	1.3	11.9·	1.3	12.4	1.4	12.9	1.4	13.4	1.5	30
40	10.3	1.1	10.8	1.1	11.2·	1.1	11.8	1.2	12.3	1.3	12.8	1.3	13.3	1.4	13.9	1.5	14.4	1.5	15.0	1.6	20
50	11.3·	1.0	11.9	1.1	12.4	1.2	13.0	1.2	13.5·	1.2	14.1	1.3	14.7	1.4	15.3	1.4	15.9	1.5	16.6	1.6	10
3 0	12.4	1.1	13.0	1.1	13.6	1.2	14.2	1.2	14.8	1.3	15.5	1.4	16.1	1.4	16.8	1.5	17.5	1.6	18.1	1.5	0
10	13.5	1.1	14.1·	1.1	14.8	1.2	15.5	1.3	16.1	1.3	16.8	1.3	17.5	1.4	18.2	1.4	19.0	1.5	19.7	1.6	8 50
20	14.6	1.1	15.3	1.2	16.0	1.2	16.7	1.2	17.4	1.3	18.2	1.4	18.9	1.4	19.7	1.5	20.5	1.5	21.3	1.6	40
30	15.6·	1.0	16.4	1.1	17.1	1.1	17.9	1.2	18.7	1.3	19.5	1.3	20.3	1.4	21.1	1.4	22.0	1.5	22.8	1.5	30
40	16.7	1.1	17.5	1.1	18.3	1.2	19.1	1.2	19.9	1.2	20.8	1.3	21.6	1.3	22.5	1.4	23.4	1.4	24.3	1.5	20
50	17.7	1.0	18.5	1.0	19.4	1.1	20.2	1.1	21.1	1.2	22.0	1.2	22.9	1.3	23.9	1.4	24.8	1.4	25.8	1.5	10
4 0	18.6·	0.9	19.5	1.0	20.4	1.0	21.3	1.1	22.3	1.2	23.2	1.2	24.2	1.3	25.2	1.3	26.2	1.4	27.2	1.4	0
10	19.6	1.0	20.5	1.0	21.4	1.0	22.4	1.1	23.4	1.1	24.3·	1.1	25.4	1.2	26.4	1.2	27.5	1.3	28.5	1.3	7 50
20	20.4	0.8	21.4	0.9	22.4	1.0	23.4	1.0	24.4	1.0	25.4	1.1	26.5	1.1	27.6	1.2	28.7	1.2	29.8	1.3	40
30	21.2	.8	22.2	.8	23.3	0.9	24.3	0.9	25.3·	0.9	26.4	1.0	27.5	1.0	28.6·	1.0	29.8	1.1	31.0	1.2	30
40	22.0	.8	23.0	.8	24.1	.8	25.1	.8	26.2	.9	27.3	0.9	28.5	1.0	29.6	1.0	30.8	1.0	32.0	1.0	20
50	22.6	.6	23.7	.7	24.8	.7	25.9	.8	27.0	.8	28.2	.9	29.3	0.8	30.5	0.9	31.7	0.9	33.0	1.0	10
5 0	23.2	.6	24.3	.6	25.4	.6	26.5·	.6	27.7	.7	28.9	.7	30.1	.8	31.3	.8	32.6	.9	33.8	0.8	0
10	23.7	.5	24.8	.5	26.0	.6	27.1	.6	28.3	.6	29.5	.6	30.7	.6	32.0	.7	33.3	.7	34.6	.8	6 50
20	24.1	.4	25.3	.5	26.4	.4	27.6	.5	28.8	.5	30.0	.5	31.3	.6	32.5	.5	33.8	.5	35.2	.6	40
30	24.4·	.3	25.6	.3	26.8	.4	28.0	.4	29.2	.4	30.4	.4	31.7	.4	33.0	.5	34.3	.5	35.6	.4	30
40	24.7	.3	25.8·	.2	27.0	.2	28.2	.2	29.5	.3	30.7	.3	32.0	.3	33.3	.3	34.6	.3	36.0	.4	20
50	24.8	.1	26.0	.2	27.2	.2	28.4	.2	29.6	.1	30.9	.2	32.2	.2	33.5	.2	34.8	.2	36.2	.2	10
6 0	24.9	.1	26.0·	.0	27.2	.0	28.5	.1	29.7	.1	31.0	.1	32.2	.0	33.6	.1	34.9	.1	36.3	.1	6 0

TABLE C.

C = *the 3d correction,* (additive.) Hor. Arg., *the star's declination.* Vert. Arg., *B* = *the 2d correction.*

B	88° 38′						88° 39′						
	0″	10″	20″	30″	40″	50″	0″	10″	20″	30″	40″	50″	60″
″	″	″	″	″	″	″	″	″	″	″	″	″	″
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.5	0.4	0.4	0.4	0.3	0.3	0.2·	0.2	0.2	0.1	0.1	0.0	0.0
20	1.0	0.9	0.8	0.7·	0.7	0.6	0.5	0.4	0.3	0.2·	0.2	0.1	0.0
30	1.5	1.4·	1.3	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.2·	0.1	0.0
40	2.0	1.8·	1.7	1.5	1.3	1.2	1.0	0.8	0.7	0.5	0.3	0.2	0.0

TABLE B—Continued.

FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

B = the 2d correction. This correction is always *additive.*

Star's Hour Angle.	STAR'S ALTITUDE.																				Star's Hour Angle.
	34°		35°		36°		37°		38°		39°		40°		41°		42°		43°		
h m	"		"		"		"		"		"		"		"		"		"		h m
0 0	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		12 0
10	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	11 50
20	0.3	.2	0.3	.2	0.3	.2	0.3	.2	0.3	.2	0.3	.2	0.4	.3	0.4	.3	0.4	.3	0.4	.3	40
30	0.6	.3	0.7	.4	0.7	.4	0.7	.4	0.7	.4	0.8	.5	0.8	.4	0.8	.4	0.9	.5	0.9	.5	30
40	1.1	.5	1.2	.5	1.2	.5	1.3	.6	1.3	.6	1.4	.6	1.4	.6	1.5	.7	1.5	.6	1.6	.7	20
50	1.8	.7	1.8	.6	1.9	.7	2.0	.7	2.0	.7	2.1	.7	2.2	.8	2.3	.8	2.4	.9	2.4	.8	10
1 0	2.5	.7	2.6	.8	2.7	.8	2.8	.8	2.9	.9	3.0	.9	3.1	.9	3.3	1.0	3.4	1.0	3.5	1.1	0
10	3.4	.9	3.5	.9	3.7	1.0	3.8	1.0	3.9	1.0	4.1	1.1	4.2	1.1	4.4	1.1	4.6	1.2	4.7	1.2	10 50
20	4.4	1.0	4.6	1.1	4.7	1.1	4.9	1.1	5.1	1.2	5.3	1.2	5.5	1.3	5.7	1.3	5.9	1.3	6.1	1.4	40
30	5.5	1.1	5.7	1.1	5.9	1.2	6.2	1.3	6.4	1.3	6.6	1.3	6.9	1.4	7.1	1.4	7.4	1.5	7.6	1.5	30
40	6.7	1.2	7.0	1.3	7.2	1.3	7.5	1.3	7.8	1.4	8.1	1.5	8.4	1.5	8.7	1.6	9.0	1.6	9.3	1.7	20
50	8.0	1.3	8.3	1.3	8.6	1.4	9.0	1.5	9.3	1.5	9.6	1.5	10.0	1.6	10.3	1.6	10.7	1.7	11.1	1.8	10
2 0	9.4	1.4	9.8	1.5	10.1	1.5	10.5	1.5	10.9	1.6	11.3	1.7	11.7	1.7	12.1	1.8	12.6	1.9	13.0	1.9	0
10	10.9	1.5	11.3	1.5	11.7	1.6	12.1	1.6	12.6	1.7	13.1	1.8	13.5	1.8	14.0	1.9	14.5	1.9	15.0	2.0	9 50
20	12.4	1.5	12.9	1.6	13.3	1.6	13.8	1.7	14.4	1.8	14.9	1.8	15.4	1.9	16.0	2.0	16.5	2.0	17.1	2.1	40
30	14.0	1.6	14.5	1.6	15.0	1.7	15.6	1.8	16.2	1.8	16.8	1.9	17.4	2.0	18.0	2.0	18.6	2.1	19.3	2.2	30
40	15.6	1.6	16.2	1.7	16.8	1.8	17.4	1.8	18.0	1.8	18.7	1.9	19.4	2.0	20.0	2.0	20.8	2.2	21.5	2.2	20
50	17.2	1.6	17.8	1.7	18.5	1.7	19.2	1.8	19.9	1.9	20.6	1.9	21.4	2.0	22.2	2.2	22.9	2.1	23.8	2.3	10
3 0	18.8	1.6	19.6	1.7	20.3	1.8	21.0	1.8	21.8	1.9	22.6	2.0	23.4	2.0	24.3	2.1	25.1	2.2	26.0	2.2	0
10	20.5	1.7	21.8	1.7	22.1	1.8	22.9	1.9	23.7	1.9	24.6	2.0	25.5	2.1	26.4	2.1	27.3	2.2	28.3	2.3	8 50
20	22.1	1.6	23.0	1.7	23.8	1.7	24.7	1.8	25.6	1.9	26.5	1.9	27.5	2.0	28.5	2.1	29.5	2.2	30.6	2.3	40
30	23.7	1.6	24.6	1.6	25.5	1.7	26.8	1.8	27.5	1.9	28.5	2.0	29.5	2.0	30.6	2.1	31.7	2.2	32.8	2.2	30
40	25.3	1.6	26.2	1.6	27.2	1.7	28.2	1.7	29.3	1.8	30.4	1.9	31.5	2.0	32.6	2.0	33.8	2.1	35.0	2.2	20
50	26.8	1.5	27.8	1.6	28.9	1.7	29.9	1.7	31.0	1.7	32.2	1.8	33.3	1.8	34.5	1.9	35.8	2.0	37.0	2.2	10
4 0	28.2	1.4	29.3	1.5	30.4	1.5	31.6	1.7	32.7	1.7	33.9	1.7	35.1	1.8	36.4	1.9	37.7	1.9	39.1	2.1	0
10	29.6	1.4	30.8	1.5	31.9	1.5	33.1	1.5	34.3	1.6	35.6	1.7	36.9	1.8	38.2	1.8	39.6	1.9	41.0	1.9	7 50
20	31.0	1.4	32.1	1.3	33.3	1.4	34.6	1.5	35.8	1.5	37.2	1.6	38.5	1.6	39.9	1.7	41.3	1.7	42.8	1.8	40
30	32.2	1.2	33.4	1.3	34.6	1.3	35.9	1.3	37.2	1.4	38.6	1.4	40.0	1.5	41.4	1.5	42.9	1.6	44.5	1.7	30
40	33.3	1.1	34.5	1.1	35.8	1.2	37.2	1.3	38.5	1.3	39.9	1.3	41.4	1.4	42.9	1.5	44.4	1.5	46.0	1.5	20
50	34.3	1.0	35.6	1.1	36.9	1.1	38.3	1.1	39.7	1.2	41.1	1.2	42.6	1.2	44.2	1.3	45.7	1.3	47.4	1.4	10
5 0	35.1	0.8	36.5	0.9	37.9	1.0	39.3	1.0	40.7	1.0	42.2	1.1	43.7	1.1	45.3	1.1	46.9	1.2	48.6	1.2	0
10	35.9	.8	37.3	.8	38.7	0.8	40.1	0.8	41.6	0.9	43.1	0.9	44.7	1.0	46.3	1.0	47.9	1.0	49.6	1.0	6 50
20	36.5	.6	37.9	.6	39.4	.7	40.8	.7	42.3	.7	43.9	.8	45.5	0.8	47.1	0.8	48.8	0.9	50.5	0.9	40
30	37.0	.5	38.4	.5	39.9	.5	41.4	.6	42.9	.6	44.5	.6	46.1	.6	47.7	.6	49.4	.6	51.2	.7	30
40	37.4	.4	38.8	.4	40.3	.4	41.8	.4	43.3	.4	44.9	.4	46.5	.4	48.2	.5	49.9	.5	51.7	.5	20
50	37.6	.2	39.0	.2	40.5	.2	42.0	.2	43.5	.2	45.1	.2	46.8	.3	48.5	.3	50.2	.3	52.0	.3	10
6 0	37.7	.1	39.1	.1	40.6	.1	42.1	.1	43.6	.1	45.2	.1	46.9	.1	48.5	.1	50.3	.1	52.1	.1	6 0

TABLE C—Continued.

C = the 3d correction, (additive.) Hor. Arg., *the star's declination.* Vert. Arg., *B = the 2d correction.*

B	88° 38′						88° 39′						
	0″	10″	20″	30″	40″	50″	0″	10″	20″	30″	40″	50″	60″
"	"	"	"	"	"	"	"	"	"	"	"	"	"
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0
20	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.0
30	1.5	1.4	1.3	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.2	0.1	0.0
40	2.0	1.8	1.7	1.5	1.3	1.2	1.0	0.8	0.7	0.5	0.3	0.2	0.0
50	2.5	2.3	2.1	1.9	1.7	1.5	1.3	1.0	0.8	0.6	0.4	0.2	0.0

TABLE B—CONTINUED.

FOR FINDING THE LATITUDE OF A PLACE BY ALTITUDES OF POLARIS.

B = *the 2d correction.* This correction is always *additive.*

Star's Hour Angle.	STAR'S ALTITUDE.																		Star's Hour Angle.
	44°		45°		46°		47°		48°		49°		50°		51°		52°		
h m	″		″		″		″		″		″		″		″		″		h m
0 0	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		12 0
10	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	0.1	.1	11 50
20	0.4	.3	0.4	.3	0.4	.3	0.4	.3	0.5	.4	0.5	.4	0.5	.4	0.5	.4	0.5	.4	40
30	0.9	.5	0.9	.5	1.0	.6	1.0	.6	1.1	.6	1.1	.6	1.1	.6	1.2	.7	1.2	.7	30
40	1.6	.7	1.7	.8	1.7	.7	1.8	.8	1.9	.8	1.9	.8	2.0	.9	2.1	.9	2.2	1.0	20
50	2.5	.9	2.6	.9	2.7	1.0	2.8	1.0	2.9	1.0	3.0	1.1	3.1	1.1	3.2	1.1	3.4	1.2	10
1 0	3.6	1.1	3.7	1.1	3.9	1.2	4.0	1.2	4.2	1.3	4.3	1.3	4.5	1.4	4.6	1.4	4.8	1.4	0
10	4.9	1.3	5.0	1.3	5.2	1.3	5.4	1.4	5.6	1.4	5.8	1.5	6.0	1.5	6.2	1.6	6.5	1.7	10 50
20	6.3	1.4	6.5	1.5	6.8	1.6	7.0	1.6	7.3	1.7	7.5	1.7	7.8	1.8	8.1	1.9	8.4	1.9	40
30	7.9	1.6	8.2	1.7	8.5	1.7	8.8	1.8	9.1	1.8	9.4	1.9	9.8	2.0	10.1	2.0	10.5	2.1	30
40	9.6	1.7	10.0	1.8	10.3	1.8	10.7	1.9	11.1	2.0	11.5	2.1	11.9	2.1	12.3	2.2	12.8	2.3	20
50	11.5	1.9	11.9	1.9	12.3	2.0	12.8	2.1	13.2	2.1	13.7	2.2	14.2	2.3	14.7	2.4	15.2	2.4	10
2 0	13.5	2.0	14.0	2.1	14.5	2.2	15.0	2.2	15.5	2.3	16.1	2.4	16.6	2.4	17.2	2.5	17.9	2.7	0
10	15.6	2.1	16.1	2.1	16.7	2.2	17.3	2.3	17.9	2.4	18.5	2.4	19.2	2.6	19.9	2.7	20.6	2.7	9 50
20	17.7	2.1	18.4	2.3	19.0	2.3	19.7	2.4	20.4	2.5	21.1	2.6	21.9	2.7	22.7	2.8	23.5	2.9	40
30	20.0	2.3	20.7	2.3	21.4	2.4	22.2	2.5	23.0	2.6	23.8	2.7	24.7	2.8	25.6	2.9	26.5	3.0	30
40	22.3	2.3	23.1	2.4	23.9	2.5	24.7	2.5	25.6	2.6	26.6	2.8	27.5	2.8	28.5	2.9	29.5	3.0	20
50	24.6	2.3	25.5	2.4	26.4	2.5	27.3	2.6	28.3	2.7	29.3	2.7	30.4	2.9	31.5	3.0	32.6	3.1	10
3 0	27.0	2.4	27.9	2.4	28.9	2.5	29.9	2.6	31.0	2.7	32.1	2.8	33.3	2.9	34.5	3.0	35.7	3.1	0
10	29.3	2.3	30.4	2.5	31.4	2.5	32.6	2.7	33.7	2.7	34.9	2.8	36.2	2.9	37.5	3.0	38.9	3.2	8 50
20	31.7	2.4	32.8	2.4	33.9	2.5	35.2	2.6	36.4	2.7	37.7	2.8	39.1	2.9	40.5	3.0	42.0	3.1	40
30	34.0	2.3	35.2	2.4	36.4	2.5	37.7	2.5	39.0	2.6	40.4	2.7	41.9	2.8	43.4	2.9	45.0	3.1	30
40	36.2	2.2	37.5	2.3	38.8	2.4	40.2	2.5	41.6	2.6	43.1	2.7	44.7	2.8	46.3	2.9	48.0	3.0	20
50	38.4	2.2	39.7	2.2	41.1	2.3	42.6	2.4	44.1	2.5	45.7	2.6	47.3	2.6	49.1	2.9	50.9	2.9	10
4 0	40.4	2.0	41.9	2.2	43.4	2.3	44.9	2.3	46.5	2.4	48.2	2.5	49.9	2.6	51.7	2.6	53.6	2.7	0
10	42.4	2.0	43.9	2.0	45.5	2.1	47.1	2.2	48.8	2.3	50.6	2.4	52.4	2.5	54.3	2.6	56.2	2.6	7 50
20	44.3	1.9	45.9	2.0	47.5	2.0	49.2	2.1	50.9	2.1	52.8	2.2	54.7	2.3	56.7	2.4	58.7	2.5	40
30	46.0	1.7	47.7	1.8	49.4	1.9	51.1	1.9	52.9	2.0	54.8	2.0	56.8	2.1	58.9	2.2	61.0	2.3	30
40	47.6	1.6	49.3	1.6	51.1	1.7	52.9	1.8	54.8	1.9	56.7	1.9	58.8	2.0	60.9	2.0	63.1	2.1	20
50	49.1	1.5	50.8	1.5	52.6	1.5	54.5	1.6	56.4	1.6	58.4	1.7	60.5	1.7	62.7	1.8	65.0	1.9	10
5 0	50.3	1.2	52.1	1.3	54.0	1.4	55.9	1.4	57.9	1.5	60.0	1.6	62.1	1.6	64.4	1.7	66.7	1.7	0
10	51.4	1.1	53.2	1.1	55.1	1.1	57.1	1.2	59.1	1.2	61.3	1.3	63.4	1.3	65.7	1.3	68.1	1.4	6 50
20	52.3	0.9	54.2	1.0	56.1	1.0	58.1	1.0	60.2	1.1	62.3	1.0	64.6	1.2	66.9	1.2	69.3	1.2	40
30	53.0	.7	54.9	0.7	56.9	0.8	58.9	0.8	61.0	0.8	63.2	0.9	65.4	0.8	67.8	0.9	70.3	1.0	30
40	53.5	.5	55.4	.5	57.4	.5	59.4	.5	61.6	.6	63.8	.6	66.1	.7	68.5	.7	71.0	0.7	20
50	53.8	.3	55.7	.3	57.7	.3	59.8	.4	61.9	.3	64.1	.3	66.4	.3	68.8	.3	71.4	.4	10
6 0	53.9	.1	55.9	.2	57.8	.1	59.9	.1	62.0	.1	64.3	.2	66.6	.2	69.0	.2	71.5	.1	6 0

TABLE C—CONTINUED.

C = *the 3d correction*, (additive.) Hor. Arg., *the star's declination.* Vert. Arg., *B* = *the 2d correction.*

B	88° 38′						88° 39′						
	0″	10″	20″	30″	40″	50″	0′	10″	20″	30″	40″	50″	60″
″	″	″	″	″	″	″	″	″	″	″	″	″	″
30	1.5	1.4	1.3	1.1	1.0	0.9	0.7	0.6	0.5	0.4	0.2	0.1	0.0
40	2.0	1.8	1.7	1.5	1.3	1.2	1.0	0.8	0.7	0.5	0.3	0.2	0.0
50	2.5	2.3	2.1	1.9	1.7	1.5	1.3	1.0	0.8	0.6	0.4	0.2	0.0
60	3.0	2.8	2.5	2.3	2.0	1.8	1.5	1.3	1.0	0.7	0.5	0.2	0.0
70	3.5	3.2	2.9	2.6	2.3	2.0	1.8	1.5	1.2	0.9	0.6	0.3	0.0
80	4.0	3.7	3.4	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0.3	0.0